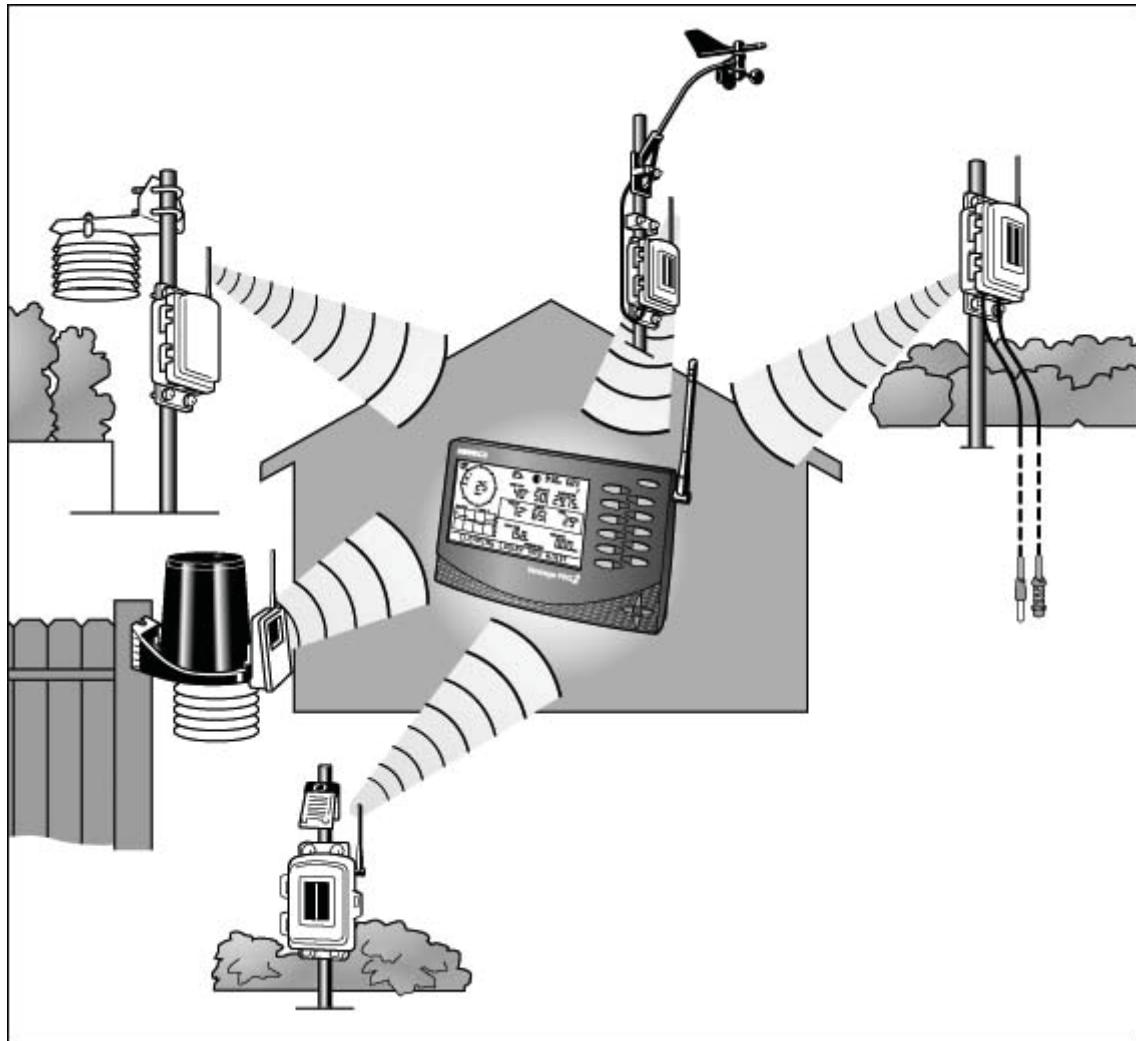


# Weather Product Specifications



- Vantage Pro<sup>TM</sup>
- Perception<sup>®</sup> & Weather Wizard III<sup>®</sup>
- Sensors, Installation Options & WeatherLink<sup>®</sup>
- WindScribe<sup>™</sup>

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**Davis Instruments Part Number: PR-41S**

**Weather Product Specifications**

Rev E, January 4, 2007

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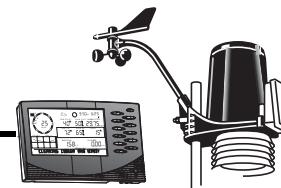
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# Cabled Vantage Pro2™ & Vantage Pro2 Plus™ Stations



6152C  
6162C

Vantage Pro™

The Vantage Pro2™ (# 6152C) and Vantage Pro2™ Plus (# 6162C) cabled weather stations include two components: the Integrated Sensor Suite (ISS) and the console. The ISS contains the sensor interface module (SIM), rain collector, an anemometer, and a passive radiation shield. The Vantage Pro2 console provides the user interface, data display, and calculations. The Vantage Pro2 Plus weather station includes two additional sensors that are optional on the Vantage Pro2 and purchased separately: the UV Sensor and the Solar Radiation Sensor. The console and ISS are powered by an AC-power adapter connected to the console. Batteries can be installed in the console to provide a backup power supply. Use WeatherLink® for Vantage Pro and Vantage Pro2 to let your weather station interface with a computer, log data, and upload weather information to the Internet. The 6152C and 6162C models rely on passive shielding to reduce solar-radiation induced temperature errors in the outside temperature sensor readings.

## Integrated Sensor Suite (ISS)

Operating Temperature	-40° to +140°F (-40° to +60°C)
Storage Temperature	-50° to +158°F (-45° to +70°C)
Power Source, ISS SIM	Vantage Pro2 console / AC-power adapter
Connectors	Modular RJ-11
Cable Type	4-conductor, 26 AWG
Cable Length, Console	100' (30 m) (supplied) 1000' (300 m) (maximum recommended)
Cable Length, Anemometer	40' (12 m) (supplied), 240' (73 m) (maximum recommended)
Wind Speed Sensor	Large wind cups with magnetic switch
Wind Direction Sensor	Wind vane with potentiometer
Rain Collector Type	Tip bucket, 0.01" per tip, 33.2 in <sup>2</sup> (214 cm <sup>2</sup> ) collection area
Temperature Sensor Type	Thermistor
Relative Humidity Sensor Type	Film capacitor element
Housing Material	UV-resistant PVC plastic
Sensor Inputs	
RF Filtering	RC low-pass filter on each signal line

ISS Dimensions:

Product #	Dimensions (Length x Width x Height)	Package Weight
6152C	11.0" x 9.3" x 14.0" (279 mm x 238 mm x 355 mm)	5.7 lbs. (2.6 kg)
6162C		6.1 lbs. (2.8 kg)

## Console

Console Operating Temperature	+14° to +140°F (-10° to +60°C)
Display Temperature	+32° to +140°F (0° to +60°C)
Storage Temperature	-5° to +158°F (-20° to +70°C)
Current Draw (includes ISS)	0.10 mA (average), 15 mA (peak) (plus 120 mA for illuminated display) at 4 to 6 VDC
Power Adapter	5 VDC, 200 mA
Battery Backup	3 C-cells
Battery Life (no AC power)	1 month (approximately)
Connectors	Modular RJ-11
Housing Material	UV-resistant PVC plastic
Console Display Type	LCD Transflective
Dimensions (Console: length x width x height; Display: length x height)	
Console	9.63" x 1.50" 6.13" (244 mm x 38 mm x 156 mm)
Display	5.94" x 3.375" (151 mm x 86 mm)
Weight (with batteries)	1.88 lbs. (.85 kg)

## Data Displayed on Console

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The data display categories represent all weather variables that the console displays and are listed in alphabetical order. General describes the general ways in which data is displayed and archived for all data display categories and is listed first as a point of reference. See the individual data display categories for specific display information.

### General

Daily Data . . . . .	Includes the earliest time of occurrence of highs and lows; period begins/ends at 12:00 am
Monthly Data . . . . .	Period begins/ends at 12:00 am on the first of the month
Yearly Data . . . . .	Period begins/ends at 12:00 am on the first of January unless otherwise noted
Current Display Data . . . . .	Current display data describes the current reading for each weather variable. In most cases, the variable lists the most recently updated reading or calculation. Some current variable displays can be adjusted so there is an offset for the reading.
Current Graph Data . . . . .	Current graph data appears in the right most column in the console graph and represents the latest value within the last period on the graph; totals can be set or reset. Display intervals vary. Example include: Instant, 15-min., and Hourly Reading; Daily, Monthly, High and Low
Historical Graph Data . . . . .	Includes the past 24 values listed unless otherwise noted; all can be cleared and all totals reset. Display intervals vary. Examples include: 15-min., and Hourly Reading; Daily, Monthly, High and Low
Graph Time Interval Length . . . . .	1 min., 10 min., 15 min., 1 hour, 1 day, 1 month, 1 year (user-selectable, availability depends upon variable selected)
Graph Time Span . . . . .	24 Intervals + current interval (see graph intervals to determine time span)
Graph Variable Span (Vertical Scale) . . . . .	Automatic (varies depending upon data range); Maximum and Minimum value in range appear in ticker
Alarm Indication . . . . .	Alarms sound for only 2 minutes (time alarm is always 1 minute) if operating on battery power. Alarm message is displayed in ticker as long as threshold is met or exceeded. Alarms can be silenced (but not cleared) by pressing the DONE key.
Update Interval . . . . .	Varies with sensor - see individual sensor specifications

### Barometric Pressure

Resolution and Units . . . . .	Measured in 0.01" Hg. Other units are converted from Hg and rounded to nearest 0.1 mm, 0.1 hPa, 0.1mb
Corrected Range . . . . .	26.00" to 32.00" Hg, 660.0 to 810.0 mm Hg, 880.0 to 1080.0 hPa(mb)
Uncorrected Range . . . . .	16.00" to 33.50" Hg, 406.0 to 850.0 mm Hg, 542.0 to 1130.0 hPa(mb)
Elevation Range . . . . .	-1500' to +15,300' (-460 m to 4670 m). The console screen limits display of lower elevation to -999' when using feet as elevation unit.
Uncorrected Reading Accuracy . . . . .	±0.03" Hg (±0.8 mm Hg, ±1.0 hPa(mb) (at room temperature)
Sea-Level Reduction Equation Used . . . . .	United States Method employed prior to use of current "R Factor" method
Equation Source . . . . .	Smithsonian Meteorological Tables
Equation Accuracy . . . . .	±0.01" Hg (±0.3 mm Hg, ±0.3 hPa(mb)
Elevation Accuracy Required . . . . .	±10' (3m) to meet equation accuracy specification
Overall Accuracy . . . . .	±0.04" Hg (±1.0 mm Hg, ±1.4 hPa(mb)
Trend (change in 3 hours) . . . . .	Change 0.06" (2.0 hPa(mb, 1.5 mm Hg) = Rapidly Change 0.02" (0.7hPa(mb, 0.5 mm Hg)= Slowly
Trend Indication . . . . .	5 position arrow: Rising (rapidly or slowly), Steady, or Falling (rapidly or slowly)
Update Interval . . . . .	15 minutes or when console BAR key is pressed twice
Current Display Data . . . . .	Instant
Current Graph Data . . . . .	Instant, 15-min., and Hourly Reading; Daily, Monthly, High and Low
Historical Graph Data . . . . .	15-min. and Hourly Reading; Daily, Monthly Highs and Lows

Alarms..... High Threshold from Current Trend for Storm Clearing (Rising Trend)  
 Low Threshold from Current Trend for Storm Warning (Falling Trend)  
 Rising and Falling Trend Alarms Range..... 0.01 to 0.25" Hg (0.1 to 6.4 mm Hg, 0.1 to 8.5 hPa/mb)

## Clock

Accuracy ..... ±8 seconds/month  
 Resolution ..... 1 minute  
 Units ..... Time: 12 or 24 hour format (user-selectable)  
 Date: US or International format (user-selectable)  
 Adjustments  
 Time ..... Automatic Daylight Savings Time (for users in North America, Europe and Australia that observe it in AUTO mode, MANUAL setting available for all other areas)  
 Date ..... Automatic Leap Year  
 Alarms..... Once per day at set time when active

## Dewpoint (calculated)

Resolution and Units ..... 1°F for 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C  
 Range ..... -105° to +130°F (-76° to +54°C)  
 Accuracy ..... ±3°F (±1.5°C) (typical)  
 Update Interval ..... 10 seconds  
 Source ..... World Meteorological Organization (WMO)  
 Equation Used ..... WMO Equation with respect to saturation of moist air over water  
 Variables Used ..... Instant Outside Temperature and Instant Outside Relative Humidity  
 Current Display Data ..... Instant Calculation  
 Current Graph Data ..... Instant Calculation; Daily, Monthly High and Low  
 Historical Graph Data ..... Hourly Calculations; Daily, Monthly Highs and Lows  
 Alarms..... High and Low Threshold from Instant Calculation

## Evapotranspiration (calculated, requires Solar Radiation Sensor)

Resolution and Units ..... Measured in 0.01". Converted to mm and rounded to nearest 0.2 mm  
 Range ..... Daily to 99.99" (999.9 mm); Monthly & Yearly to 199.99" (1999.9 mm)  
 Accuracy ..... Greater of 0.01" (0.25 mm) or ±5%, Reference: side-by-side comparison against a CIMIS ET weather station  
 Update Interval ..... 1 hour  
 Calculation and Source ..... Penman-Monteith Equation as implemented by CIMIS (California Irrigation Management Information System) including Net Radiation calculation  
 Current Display Data ..... Latest Hourly Total Calculation  
 Current Graph Data ..... Latest Hourly Total Calculation, Daily, Monthly, Yearly Total  
 Historical Graph Data ..... Hourly, Daily, Monthly, Yearly Totals  
 Alarm ..... High Threshold from Latest Daily Total Calculation

## Forecast

Variables Used ..... Barometric Reading & Trend, Wind Speed & Direction, Rainfall, Temperature, Humidity, Latitude & Longitude, Time of Year  
 Update Interval ..... 1 hour  
 Display Format ..... Icons on top center of display; detailed message in ticker at bottom  
 Variables Predicted ..... Sky Condition, Precipitation, Temperature Changes, Wind Direction and Speed

**Heat Index (calculated)**

Resolution and Units	1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range	-40° to +135°F (-40° to +57°C)
Accuracy	±3°F (±1.5°C) (typical)
Update Interval	10 seconds
Source	United States National Weather Service (NWS)/NOAA
Formulation Used	Steadman (1979) modified by US NWS/NOAA and Davis Instruments to increase range of use
Variables Used	Instant Outside Temperature and Instant Outside Relative Humidity
Current Display Data	Instant Calculation
Current Graph Data	Instant Calculation; Daily, Monthly High
Historical Graph Data	Hourly Calculations; Daily, Monthly Highs
Alarm	High Threshold from Instant Calculation

**Humidity**

## Inside Relative Humidity (sensor located in console)

Resolution and Units	1%
Range	0 to 100% RH
Accuracy	±5%
Update Interval	1 minute
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant, Hourly Reading; Daily, Monthly High and Low
Historical Graph Data	Hourly Readings; Daily, Monthly Highs and Lows
Alarms	High and Low Threshold from Instant Reading

## Outside Relative Humidity (sensor located in ISS)

Resolution and Units	1%
Range	0 to 100% RH
Accuracy	±3% (0 to 90% RH), ±4% (90 to 100% RH)
Temperature Coefficient	0.03% per °F (0.05% per °C), reference 68°F (20°C)
Drift	±0.5% per year
Update Interval	50 seconds
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant and Hourly Reading; Daily, Monthly High and Low
Historical Graph Data	Hourly Readings; Daily, Monthly Highs and Lows
Alarms	High and Low Threshold from Instant Reading

**Moon Phase**

Console Resolution	1/8 (12.5%) of a lunar cycle, 1/4 (25%) of lighted face on console
WeatherLink Resolution	0.09% of a lunar cycle, 0.18% of lighted face maximum (depends on screen resolution)
Range	New Moon, Waxing Crescent, First Quarter, Waxing Gibbous, Full Moon, Wanning Gibbous, Last Quarter, Waning Crescent
Accuracy	±38 minutes

**Rainfall**

Resolution and Units	0.01" or 0.2 mm with optional metric adapter (included) (Console rounds 1 mm if rain totals are 2000 mm or higher)
Daily/Storm Rainfall Range	0 to 99.99" (0 to 9999 mm)
Monthly/Yearly/Total Rainfall Range	0 to 199.99" (0 to 19999 mm)
Rain Rate	0 to 199.99" (0 to 19999 mm)
Accuracy	For rain rates up to 2"/hr (50 mm/hr): ±4% of total or +0.01" (0.2 mm) (0.01" = one tip of the bucket, 0.2 mm with metric adapter), whichever is greater. For rain rates from 2"/hr (50 mm/hr) to 4"/hr (100 mm/hr): ±5% of total or +0.01" (0.2 mm) (0.01" = one tip of the bucket, 0.2 mm with metric rain adapter), whichever is greater.
Update Interval	10 seconds
Storm Determination Method	0.02" (0.5 mm) begins a storm event, 24 hours without further

Current Display Data	.....	accumulation ends a storm event
Current Graph Data	.....	Totals for Past 15-min
Historical Graph Data	.....	Totals for Past 15-min, Past 24-hour, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin date); Umbrella is displayed when 15 minute total exceeds zero
Alarms	.....	Totals for 15-min, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin and end dates)
Range for Rain Alarms	.....	High Threshold called "Flash Flood" (15-min. Total, default is 0.50", 12.7 mm), 24-hour Total, Storm Total
		0 to 99.99" (0 to 999.7 mm)

## Rain Rate

Resolution and Units	.....	0.01" or 0.2 mm (with optional metric adapter (included)) at typical rates (see Fig. 2 and 3)
Range	.....	0, 0.04"/hr (1 mm/hr) to 100"/hr (0 to 1999.9 mm/hr)
Accuracy	.....	±5% or ±0.04"/hr (1 mm/hr) (up to 10"/hr. [250 mm/hr.]), whichever is greater
Update Interval	.....	10 seconds
Calculation Method	.....	Measures time between successive tips of rain collector. Elapsed time greater than 15 minutes or only one tip of the rain collector constitutes a rain rate of zero.
Current Display Data	.....	Instant
Current Graph Data	.....	Instant and 1-min. Reading; Hourly, Daily, Monthly, Yearly High
Historical Graph Data	.....	1-min Reading; Hourly, Daily, Monthly, Yearly Highs
Alarm	.....	High Threshold from Instant Reading

## Solar Radiation (requires Solar Radiation Sensor)

Resolution and Units	.....	1 W/m <sup>2</sup>
Range	.....	0 to 1800 W/m <sup>2</sup>
Accuracy	.....	±5% of full scale (Reference: Eppley PSP at 1000 W/m <sup>2</sup> )
Drift	.....	Up to ±2% per year
Cosine Response	.....	±3% for angle of incidence from 0° to 75°
Temperature Coefficient	.....	-0.067% per °F (-0.12% per °C); reference temperature = 77°F (25°C)
Update Interval	.....	50 seconds (5 minutes when dark)
Current Display Data	.....	Instant
Current Graph Data	.....	Instant Reading and Hourly Average; Daily, Monthly High
Historical Graph Data	.....	Hourly Average, Daily, Monthly Highs
Alarm	.....	High Threshold from Instant Reading

## Sunrise and Sunset

Resolution	.....	1 minute
Accuracy	.....	±1 minute
Reference	.....	United States Naval Observatory

## Temperature

Inside Temperature (sensor located in console)		
Resolution and Units	.....	Current Data: 0.1°F or 1°F or 0.1°C or 1°C. (nominal). Celsius is converted from Fahrenheit and rounded to the nearest 0.1° or 1°C.
		Historical Graph Data and Alarms: 1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C.
Range	.....	+32° to +140°F (0° to +60°C)
Sensor Accuracy	.....	±1°F (±0.5°C) typical
Update Interval	.....	1 minute
Current Display Data	.....	Instant (user-adjustable offset available)
Current Graph Data	.....	Instant; Daily and Monthly High and Low
Historical Graph Data	.....	Hourly Readings; Daily and Monthly Highs and Lows
Alarms	.....	High and Low Thresholds from Instant Reading

**Vantage Pro2™**

Outside Temperature (sensor located in ISS)

Resolution and Units	Current Data: 0.1°F or 1°F or 0.1°C or 1°C. °(nominal). Celsius is converted from Fahrenheit and rounded to the nearest 0.1° or 1°C.
Historical Graph Data and Alarms	1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range	-40° to +150°F (-40° to +65°C)
Sensor Accuracy	±1°F (±0.5°C) typical (see Fig. 1)
Radiation Induced Error	+4°F (2°C) at solar noon (insolation = 1040 W/m <sup>2</sup> , avg. wind speed ≤ 2 mph (1 m/s)) (reference: RM Young Model 43408 Fan-Aspirated Radiation Shield)
Update Interval	10 seconds
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant Reading; Daily, Monthly, Yearly High and Low
Historical Graph Data	Hourly Readings; Daily and Monthly Highs and Lows
Alarms	High and Low Thresholds from Instant Reading

**Temperature Humidity Sun Wind Index (requires Solar Radiation Sensor)**

Resolution and Units	1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C.
Range	-90° to +135°F (-68° to +64°C)
Accuracy	±4°F (±2°C) (typical)
Update Interval	10 seconds
Sources and Formulation Used	United States National Weather Service (NWS)/NOAA Steadman (1979) modified by US NWS/NOAA and Davis Instruments to increase range of use
Variables Used	Instant Outside Temperature, Instant Outside Relative Humidity, 10-minute Average Wind Speed, 10-minute Average Solar Radiation
Formulation Description	Uses Heat Index as base temperature. Effects of wind and solar radiation are either added or subtracted from this base to give an overall effective temperature
Current Display Data	Instant
Current Graph Data	Instant and Hourly Calculation; Daily, Monthly Highs
Historical Graph Data	Hourly Calculation; Daily, Monthly Highs
Alarm	High Threshold from Instant Reading

**Ultra Violet (UV) Radiation Dose (requires UV Sensor)**

Resolution and Units	0.1 MEDs to 19.9 MEDs; 1 MED above 19.9 MEDS
Range	0 to 199 MEDs
Accuracy	±5% of daily total
Drift	up to ±2% per year
Update Interval	50 seconds to 1 minute (5 minutes when dark)
Current Graph Data	Latest Daily Total (user resettable at any time from Current Screen)
Historical Graph Data	Hourly, Daily Totals (user reset from Current Screen does not affect these values)
Alarm	High Threshold from Daily Total
Alarm Range	0 to 19.9 MEDs

**Ultra Violet (UV) Radiation Index (requires UV Sensor)**

Resolution and Units	0.1 Index
Range	0 to 16 Index
Accuracy	±5% of full scale (Reference: Yankee UVB-1 at UV Index of 10 (extremely high))
Cosine Response	±4% (0° to 65° incident angle); 9% (65° to 85° incident angle)
Update Interval	50 seconds (5 minutes when dark)
Current Display Data	Instant
Current Graph Data	Instant and Hourly Average; Daily, Monthly High
Historical Graph Data	Hourly Average, Daily, Monthly Highs
Alarm	High Threshold from Instant Calculation

## Wind

### Wind Chill (Calculated)

Resolution and Units	1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range	-110° to +130°F (-79° to +54°C)
Accuracy	±2°F (±1°C) (typical)
Update Interval	10 seconds
Source	United States National Weather Service (NWS)/NOAA
Equation Used	Osczevski (1995) (adopted by US NWS in 2001)
Variables Used	Instant Outside Temperature and 10-min. Avg. Wind Speed
Current Display Data	Instant Calculation
Current Graph Data	Instant Calculation; Hourly, Daily, Monthly Low
Historical Graph Data	Hourly, Daily, Monthly Lows
Alarm	Low Threshold from Instant Calculation

### Wind Direction

Display Resolution	16 points (22.5°) on compass rose, 1° in numeric display
Accuracy	±4°
Update Interval	2.5 seconds
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant; 10-min. Dominant; Hourly, Daily, Monthly Dominant
Historical Graph Data	Past 6 10-min. Dominants on compass rose only; Hourly, Daily, Monthly Dominants

### Wind Speed

Resolution and Units	Measured in 1 mph. Other units are converted from mph and rounded to nearest 1 km/h, 0.1 m/s, or 1 knot
Range (large wind cups, included)	2 to 150 mph, 2 to 130 knots, 1 to 67 m/s, 3 to 241 km/h
Range (small wind cups; optional, not included)	3 to 175 mph, 3 to 150 knots, 1.5 to 79 m/s, 5 to 282 km/h
Update Interval	Instant Reading: 2.5 seconds, 10-minute Average: 1 minute
Accuracy (large wind cups, included)	±2 mph (2 kts, 3 km/h, 1 m/s) or ±5%, whichever is greater
Accuracy (small wind cups; optional, not included)	±3 mph (3 kts, 5 km/h, 1.5 m/s) or ±5%, whichever is greater
Maximum Cable Length	240' (73 m). Maximum wind speed reading decreases as length of cable from Anemometer to the ISS increases. At 140' (42 m), maximum speed is 135 mph (60 m/s). At 240' (73 m), the maximum is 100 mph.
Current Display Data	Instant
Current Graph Data	Instant; 10-minute and Hourly Average; Hourly High; Daily, Monthly, Yearly High with Direction of High
Historical Graph Data	10-min. and Hourly Averages; Hourly Highs; Daily, Monthly, Yearly Highs with Direction of Highs
Alarms	High Thresholds from Instant Reading and 10-minute

## Sensor Charts

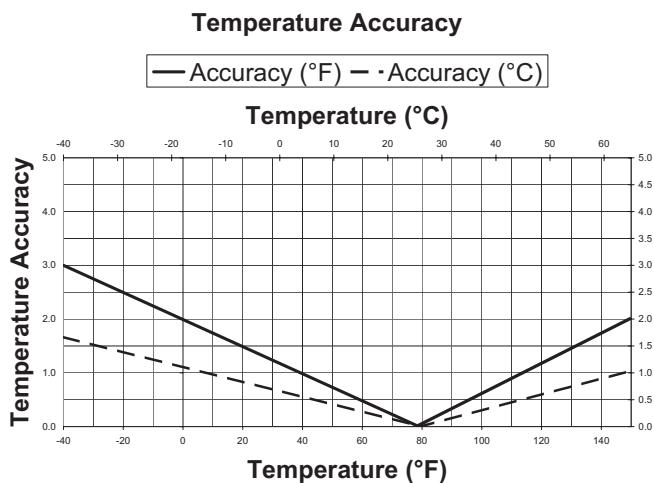


Figure 1. Temperature Accuracy

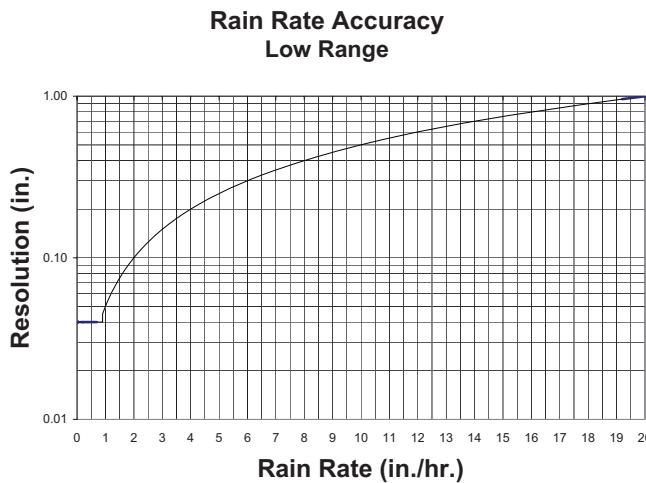


Figure 2. Low Range Rain Rate Resolution

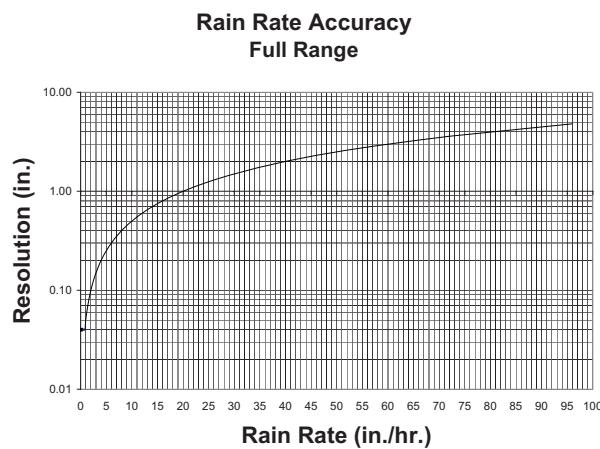


Figure 3. Full Range Rain Rate Resolution

## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6152C	17.0" x 11.0" x 13.0" (410 mm X 264 mm x 330 mm)	12.8 lbs. (5.8 kg)	011698 00755 4
6152CEU			011698 00772 1
6152CUK			011698 00773 8
6162C		13.3 lbs. (6.0 kg)	011698 00756 1
6162CEU			011698 00774 5
6162CUK			011698 00775 2

# Wireless Vantage Pro2™ & Vantage Pro2™ Plus Stations (Including Fan-Aspirated Models)



6152      6162  
6153      6163

## Vantage Pro™

The Vantage Pro2™ (# 6152, 6153) and Vantage Pro2™ Plus (# 6162, 6163) Wireless Weather Stations include two components: the Integrated Sensor Suite (ISS) which houses and manages the external sensor array, and the console which provides the user interface, data display, A/D conversion in the ISS, and calculations. The ISS and Vantage Pro2 console communicate via an FCC-certified, license-free frequency hopping transmitter and receiver. User-selectable transmitter ID codes allow up to eight stations to coexist in the same geographic area. The frequency hopping spread spectrum technology provides greater communication strength over longer distances and areas of weaker reception. The Wireless Vantage Pro2™ Plus weather station includes two additional sensors that are optional on the Vantage Pro2: the UV Sensor and the Solar Radiation Sensor. The console may be powered by batteries or by the included AC-power adapter. The wireless ISS is solar powered with a battery backup. Use WeatherLink™ for Vantage Pro and Vantage Pro2 to let your weather station interface with a computer, to log weather data, and to upload weather information to the internet.

The 6152 and 6162 rely on passive shielding to reduce solar-radiation induced temperature errors in the outside temperature sensor readings. The Fan-aspirated 6153 and 6163 combine passive shielding with a solar-powered fan that draws outside air in over the temperature and humidity sensors, providing a much more accurate temperature reading than that available using passive shielding alone.

## Integrated Sensor Suite (ISS)

Operating Temperature	-40° to +150°F (-40° to +65°C)
Storage Temperature	-50° to +158°F (-45° to +70°C)
Current Draw (ISS SIM only)	0.14 mA (average), 30 mA (peak) at 4 to 6 VDC
Solar Power Panel (ISS SIM / Fan-Aspirated)	0.5 Watts / 0.75 Watts
Battery (ISS SIM /Fan-Aspirated)	CR-123 3-Volt Lithium cell / 2 - 1.2 Volt NiCad C-cells
Battery Life (3-Volt Lithium cell)	8 months without sunlight - greater than 2 years depending on solar charging
Battery Life (NiCad C-cells)	1 year
Fan Aspiration Rate (Fan-Aspirated Only)	190 feet/min. (0.9 m/s) (full sun), 80 feet/min. (0.4 m/s) (battery only) (intake flow rate) 500 feet/min. (2.5 m/s) (full sun), 280 feet/min. (1.4 m/s) (battery only) (sensor chamber flow rate)
Connectors, Sensor	Modular RJ-11
Cable Type	4-conductor, 26 AWG
Cable Length, Anemometer	40' (12 m) (included), 240' (73 m) (maximum recommended)
Wind Speed Sensor	Large wind cups with magnetic switch
Wind Direction Sensor	Wind vane with potentiometer
Rain Collector Type	Tip bucket, 0.01" per tip (0.2 mm with metric rain adapter), 33.2 in <sup>2</sup> (214 cm <sup>2</sup> ) collection area
Temperature Sensor Type	Thermistor
Relative Humidity Sensor Type	Film capacitor element
Housing Material	UV-resistant PVC plastic
ISS Dimensions:	

Product #	(Length x Width x Height)	Weight
6152	11.00" x 9.38" x 14.00" (279 mm x 238 mm x 355 mm)	5.7 lbs. (2.6 kg)
6162		6.1 lbs. (2.6 kg)
6153	11.00" x 9.38" x 21.00" (279 mm x 238 mm x 533 mm)	8.6 lbs. (3.9 kg)
6163		9 lbs. (4.1 kg)

## Console

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Console Operating Temperature .....	+14° to +140°F (-10° to +60°C)
Display Temperature .....	+32° to +140°F (0° to +60°C)
Storage Temperature .....	-5° to +158°F (-20° to +70°C)
Current Draw .....	0.90 mA average, 20 mA peak, (plus 120 mA for display lamps, plus 0.125 mA for each optional wireless transmitter received by the console) at 4 to 6 VDC
AC Power Adapter .....	5 VDC, 900 mA, regulated
Batteries .....	3 C-cells
Battery Life .....	up to 9 months
Connectors .....	Modular RJ-11
Housing Material .....	UV-resistant PVC plastic
Console Display Type .....	LCD Transflective
Dimensions (console: length x width x height; Display: length x height)	
Console with antenna .....	10.375" x 1.5" x 6.13" (264 mm x 38 mm x 156 mm)
Console with antenna extended up .....	10.375" x 1.5" x 9.8" (264 mm x 38 mm x 248 mm)
Display .....	5.94" x 3.375" (151 mm x 86 mm)
Weight (with batteries) .....	1.88 lbs. (.85 kg)

## Data Displayed on Console

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The data display categories represent all weather variables that the console displays and are listed in alphabetical order. General describes the general ways in which data is displayed and archived for all data display categories and is listed first as a point of reference. See the individual data display categories for specific display information.

### General

Daily Data .....	Includes the earliest time of occurrence of highs and lows; period begins/ends at 12:00 am
Monthly Data .....	Period begins/ends at 12:00 am on the first of the month
Yearly Data .....	Period begins/ends at 12:00 am on the first of January unless otherwise noted
Current Display Data .....	Current display data describes the current reading for each weather variable. In most cases, the variable lists the most recently updated reading or calculation. Some current variable displays can be adjusted so there is an offset for the reading.
Current Graph Data .....	Current graph data appears in the right most column in the console graph and represents the latest value within the last period on the graph; totals can be set or reset. Display intervals vary. Examples include: Instant, 15-min., and Hourly Reading; Daily, Monthly, High and Low
Historical Graph Data .....	Includes the past 24 values listed unless otherwise noted; all can be cleared and all totals reset. Display intervals vary. Examples include: 15-min., and Hourly Reading; Daily, Monthly, High and Low
Graph Time Interval Length .....	1 min., 10 min., 15 min., 1 hour, 1 day, 1 month, 1 year (user-selectable, availability depends upon variable selected)
Graph Time Span .....	24 Intervals + current interval (see graph intervals to determine time span)
Graph Variable Span (Vertical Scale) .....	Automatic (varies depending upon data range); Maximum and Minimum value in range appear in ticker
Alarm Indication .....	Alarms sound for only 2 minutes (time alarm is always 1 minute) if operating on battery power. Alarm message is displayed in ticker as long as threshold is met or exceeded. Alarms can be silenced (but not cleared) by pressing the DONE key.
Update Interval .....	Varies with sensor - see individual sensor specifications

## Barometric Pressure

Resolution and Units	Measured in 0.01" Hg. Other units are converted from Hg and rounded to nearest 0.1 mm, 0.1 hPa, 0.1mb.
Corrected Range	26.00" to 32.00" Hg, 660.0 to 810.0 mm Hg, 880.0 to 1080.0 hPa/mb
Uncorrected Range	16.00" to 33.50" Hg, 406.0 to 850.0 mm Hg, 542.0 to 1130.0 hPa/mb
Elevation Range	-1500' to +15,300' (-460 m to 4670 m). The console screen limits display of lower elevation to -999' when using feet as elevation unit.
Uncorrected Reading Accuracy	±0.03" Hg (±0.8 mm Hg, ±1.0 hPa/mb) (at room temperature)
Sea-Level Reduction Equation Used	United States Method employed prior to use of current "R Factor" method
Equation Source	Smithsonian Meteorological Tables
Equation Accuracy	±0.01" Hg (±0.3 mm Hg, ±0.3 hPa/mb)
Elevation Accuracy Required	±10' (3m) to meet equation accuracy specification
Overall Accuracy	±0.04" Hg (±1.0 mm Hg, ±1.4 hPa/mb)
Trend (change in 3 hours)	Change 0.06" (2 hPa/mb, 1.5 mm Hg) = Rapidly Change 0.02" (0.7hPa/mb, 0.5 mm Hg)= Slowly
Trend Indication	5 position arrow: Rising (rapidly or slowly), Steady, or Falling (rapidly or slowly)
Update Interval	15 minutes or when console BAR key is pressed twice
Current Display Data	Instant
Current Graph Data	Instant, 15-min., and Hourly Reading; Daily, Monthly, High and Low
Historical Graph Data	15-min. and Hourly Reading; Daily, Monthly Highs and Lows
Alarms	High Threshold from Current Trend for Storm Clearing (Rising Trend) Low Threshold from Current Trend for Storm Warning (Falling Trend)
Range for Rising and Falling Trend Alarms	0.01 to 0.25" Hg (0.1 to 6.4 mm Hg, 0.1 to 8.5 hPa/mb)

## Clock

Resolution	1 minute
Units	Time: 12 or 24 hour format (user-selectable)
Date	US or International format (user-selectable)
Accuracy	±8 seconds/month
Adjustments	
Time:	Automatic Daylight Savings Time (for users in North America, Europe and Australia that observe it in AUTO mode, MANUAL setting available for all other areas)
Date:	Automatic Leap Year
Alarms	Once per day at set time when active

## Dewpoint (calculated)

Resolution and Units	Measured in 1°F. Celsius is converted from Fahrenheit and rounded to the nearest 1°C.
Range	-105° to +130°F (-76° to +54°C)
Accuracy	±3°F (±1.5°C) (typical)
Update Interval	10 to 12 seconds
Source	World Meteorological Organization (WMO)
Equation Used	WMO Equation with respect to saturation of moist air over water
Variables Used	Instant Outside Temperature and Instant Outside Relative Humidity
Current Display Data	Instant Calculation
Current Graph Data	Instant Calculation; Daily, Monthly High and Low
Historical Graph Data	Hourly Calculations; Daily, Monthly Highs and Lows
Alarms	High and Low Threshold from Instant Calculation

**Evapotranspiration (calculated, requires Solar Radiation Sensor)**

Resolution and Units .....	Measured in 0.01". Converted to mm and rounded to nearest 0.2 mm
Range .....	Daily to 99.99" (999.9 mm); Monthly & Yearly to 199.99" (1999.9 mm)
Accuracy .....	Greater of 0.01" (0.25 mm) or ±5%, Reference: side-by-side comparison against a CIMIS ET weather station
Update Interval .....	1 hour
Calculation and Source .....	Penman-Monteith Equation as implemented by CIMIS (California Irrigation Management Information System) including Net Radiation calculation
Current Display Data .....	Latest Hourly Total Calculation
Current Graph Data .....	Latest Hourly Total Calculation, Daily, Monthly, Yearly Total
Historical Graph Data .....	Hourly, Daily, Monthly, Yearly Totals
Alarm .....	High Threshold from Latest Daily Total Calculation

**Forecast**

Variables Used .....	Barometric Reading & Trend, Wind Speed & Direction, Rainfall, Temperature, Humidity, Latitude & Longitude, Time of Year
Update Interval .....	1 hour
Display Format .....	Icons on top center of display; detailed message in ticker at bottom
Variables Predicted .....	Sky Condition, Precipitation, Temperature Changes, Wind Direction and Speed

**Heat Index (calculated)**

solution and Units .....	1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range .....	-40° to +135°F (-40° to +57°C)
Accuracy .....	±3°F (±1.5°C) (typical)
Update Interval .....	10 seconds
Source .....	United States National Weather Service (NWS)/NOAA
Formulation Used .....	Steadman (1979) modified by US NWS/NOAA and Davis Instruments to increase range of use
Variables Used .....	Instant Outside Temperature and Instant Outside Relative Humidity
Current Display Data .....	Instant Calculation
Current Graph Data .....	Instant Calculation; Daily, Monthly High
Historical Graph Data .....	Hourly Calculations; Daily, Monthly Highs
Alarm .....	High Threshold from Instant Calculation

**Humidity**

## Inside Relative Humidity (sensor located in console)

Resolution and Units .....	1%
Range .....	0 to 100% RH
Accuracy .....	±5%
Update Interval .....	1 minute
Current Display Data .....	Instant (user-adjustable offset available)
Current Graph Data .....	Instant, Hourly Reading; Daily, Monthly High and Low
Historical Graph Data .....	Hourly Readings; Daily, Monthly Highs and Lows
Alarms .....	High and Low Threshold from Instant Reading

## Outside Relative Humidity (sensor located in ISS)

Resolution and Units .....	1%
Range .....	0 to 100% RH
Accuracy .....	±3% (0 to 90% RH), ±4% (90 to 100% RH)
Temperature Coefficient .....	0.03% per °F (0.05% per °C), reference 68°F (20°C)
Drift .....	±0.5% per year
Update Interval .....	50 seconds to 1 minute
Current Display Data .....	Instant (user-adjustable offset available)
Current Graph Data .....	Instant and Hourly Reading; Daily, Monthly High and Low
Historical Graph Data .....	Hourly Readings; Daily, Monthly Highs and Lows
Alarms .....	High and Low Threshold from Instant Reading

## Extra Outside Relative Humidity (sensor located inside Temperature/Humidity Station)

Resolution and Units .....	1%
Range .....	0 to 100% RH
Accuracy .....	±3% (0 to 90% RH), ±4% (90 to 100% RH)
Temperature Coefficient .....	0.03% per °F (0.05% per °C), reference 68°F (20°C)
Drift .....	±0.5% per year
Update Interval .....	50 seconds to 1 minute
Current Display Data .....	Instant (user-adjustable offset available)
Alarms .....	High and Low Threshold from Instant Reading

**Leaf Wetness (requires Leaf Wetness Sensor)**

Resolution .....	1
Range .....	0 to 15
Dry/Wet Threshold.....	User-selectable
Accuracy .....	±0.5
Update Interval .....	15 to 18 seconds
Current Graph Data .....	Instant Reading; Daily High and Low; Monthly High
Historical Graph Data .....	Hourly Readings; Daily Highs and Lows; Monthly Highs
Alarms.....	High and Low Thresholds from Instant Reading

**Moon Phase**

Console Resolution .....	1/8 (12.5%) of a lunar cycle, 1/4 (25%) of lighted face on console
WeatherLink Resolution.....	0.09% of a lunar cycle, 0.18% of lighted face maximum (depends on screen resolution)
Range .....	New Moon, Waxing Crescent, First Quarter, Waxing Gibbous, Full Moon, Wanning Gibbous, Last Quarter, Waning Present
Accuracy .....	±38 minutes

**Rainfall**

Resolution and Units .....	0.01" or 0.2 mm with optional metric adapter (included) (Console rounds 1 mm if rain totals are 2000 mm or higher)
Daily/Storm Rainfall Range .....	0 to 99.99" (0 to 9999 mm)
Monthly/Yearly/Total Rainfall Range .....	0 to 199.99" (0 to 19999 mm)
Rain Rate .....	0 to 199.99" (0 to 19999 mm)
Accuracy .....	For rain rates up to 2"/hr (50 mm/hr): ±4% of total or +0.01" (0.25 mm) (0.01" = one tip of the bucket), whichever is greater For rain rates from 2"/hr (50 mm/hr) to 4"/hr (100 mm/hr): ±5% of total or +0.01" (0.25 mm) (0.01" = one tip of the bucket), whichever is greater
Update Interval .....	10 to 12 seconds
Storm Determination Method .....	0.02" (0.5 mm) begins a storm event, 24 hours without further accumulation ends a storm event
Current Display Data .....	Totals for Past 15-min
Current Graph Data .....	Totals for Past 15-min, Past 24-hour, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin date); Umbrella is displayed when 15 minute total exceeds zero
Historical Graph Data .....	Totals for 15-min, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin and end dates)
Alarms.....	High Threshold called "Flash Flood" (15-min. Total, default is 0.50", 12.7 mm), 24-hour Total, Storm Total
Range for Rain Alarms .....	0 to 99.99" (0 to 999.7 mm )

**Rain Rate**

Resolution and Units .....	0.01" or 0.2 mm (with optional metric adapter (included)) at typical rates (see Fig. 2 and 3)
Range .....	0, 0.04"/hr (1 mm/hr) to 100"/hr (0 to 1999.9 mm/hr)
Accuracy .....	±5% or ±0.04"/hr (1 mm/hr) (up to 10"/hr. (250 mm/hr.)), whichever is greater
Update Interval .....	10 to 12 seconds

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Calculation Method	Measures time between successive tips of rain collector. Elapsed time greater than 15 minutes or only one tip of the rain collector constitutes a rain rate of zero.
Current Display Data	Instant
Current Graph Data	Instant and 1-min. Reading; Hourly, Daily, Monthly and Yearly High
Historical Graph Data	1-min Reading; Hourly, Daily, Monthly and Yearly Highs
Alarm	High Threshold from Instant Reading

**Soil Moisture (requires Soil Moisture Sensor)**

Resolution	1 cb
Range	0 to 200 cb
Update Interval	62.5 to 75 seconds
Current Graph Data	Instant; Daily and Monthly High and Low
Historical Graph Data	Hourly Readings; Daily and Monthly Highs and Lows
Alarms	High and Low Thresholds from Instant Reading

**Solar Radiation (requires Solar Radiation Sensor)**

Resolution and Units	1 W/m <sup>2</sup>
Range	0 to 1800 W/m <sup>2</sup>
Accuracy	±5% of full scale (Reference: Eppley PSP at 1000 W/m <sup>2</sup> )
Drift	up to ±2% per year
Cosine Response	±3% for angle of incidence from 0° to 75°
Temperature Coefficient	-0.067% per °F (-0.12% per °C); reference temperature = 77°F (25°C)
Update Interval	50 seconds to 1 minute (5 minutes when dark)
Current Graph Data	Instant Reading and Hourly Average; Daily, Monthly High
Historical Graph Data	Hourly Average, Daily, Monthly Highs
Alarm	High Threshold from Instant Reading

**Sunrise and Sunset**

Resolution	1 minute
Accuracy	±1 minute
Reference	United States Naval Observatory

**Temperature**

## Inside Temperature (sensor located in console)

Resolution and Units	Current Data: 0.1°F or 1°F or 0.1°C or 1°C. (nominal). Celsius is converted from Fahrenheit and rounded to the nearest 0.1° or 1°C. Historical Graph Data and Alarms: 1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C.
Range	+32° to +140°F (0° to +60°C)
Sensor Accuracy	±1°F (±0.5°C) typical
Update Interval	1 minute
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant; Daily and Monthly High and Low
Historical Graph Data	Hourly Readings; Daily and Monthly Highs and Lows
Alarms	High and Low Thresholds from Instant Reading

## Outside Temperature (sensor located in ISS)

Resolution and Units	Current Data: 0.1°F or 1°F or 0.1°C or 1°C. (nominal). Celsius is converted from Fahrenheit and rounded to the nearest 0.1° or 1°C. Historical Graph Data and Alarms: 1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range	-40° to +150°F (-40° to +65°C)
Sensor Accuracy	±1°F (±0.5°C) typical (see Fig. 1)
Radiation Induced Error	+4°F (2°C) at solar noon (insolation = 1040 W/m <sup>2</sup> , avg. wind speed ≤ 2 mph (1 m/s)) (reference: RM Young Model 43408 Fan-Aspirated Radiation Shield)
Update Interval	10 seconds
Current Display Data	Instant (user-adjustable offset available)

Current Graph Data . . . . .	Instant Reading (user adjustable); Daily, Monthly, Yearly High and Low
Historical Graph Data . . . . .	Hourly Readings; Daily and Monthly Highs and Lows
Alarms . . . . .	High and Low Thresholds from Instant Reading
<b>Extra Temperature Sensors or Probes</b>	
Resolution and Units . . . . .	1°F or 1°C. Historical Graph Data and Alarms: 1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range . . . . .	-40° to +150°F (-40° to +65°C)
Sensor Accuracy . . . . .	±1°F (±0.5°C) typical (see Fig. 1)
Update Interval . . . . .	10 to 12 seconds (40 to 48 seconds for Leaf Wetness/Temperature and Soil Moisture/Temperature Stations)
Current Display Data . . . . .	Instant (user-adjustable offset available)
Alarms . . . . .	High and Low Thresholds from Instant Reading

### **Temperature Humidity Sun Wind Index (requires Solar Radiation Sensor)**

Resolution and Units . . . . .	1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range . . . . .	-90° to +135°F (-68° to +64°C)
Accuracy . . . . .	±4°F (±2°C) (typical)
Update Interval . . . . .	10 to 12 seconds
Sources and Formulation Used . . . . .	United States National Weather Service (NWS)/NOAA Steadman (1979) modified by US NWS/NOAA and Davis Instruments to increase range of use
Variables Used . . . . .	Instant Outside Temperature, Instant Outside Relative Humidity, 10-minute Average Wind Speed, 10-minute Average Solar Radiation
Formulation Description . . . . .	Uses Heat Index as base temperature. Affects of wind and solar radiation are either added or subtracted from this base to give an overall effective temperature
Current Graph Data . . . . .	Instant and Hourly Calculation; Daily, Monthly High
Historical Graph Data . . . . .	Hourly Calculation; Daily, Monthly Highs
Alarm . . . . .	High Threshold from Instant Reading

### **Ultra Violet (UV) Radiation Dose (requires UV Sensor)**

Resolution and Units . . . . .	0.1 MEDs to 19.9 MEDs; 1 MED above 19.9 MEDs
Range . . . . .	0 to 199 MEDs
Accuracy . . . . .	±5% of daily total
Drift . . . . .	up to ±2% per year
Update Interval . . . . .	50 seconds to 1 minute (5 minutes when dark)
Current Graph Data . . . . .	Latest Daily Total (user resettable at any time from Current Screen)
Historical Graph Data . . . . .	Hourly, Daily Totals (user reset from Current Screen does not affect these values)
Alarm . . . . .	High Threshold from Daily Total
Alarm Range . . . . .	0 to 19.9 MEDs

### **Ultra Violet (UV) Radiation Index (requires UV Sensor)**

Resolution and Units . . . . .	0.1 Index
Range . . . . .	0 to 16 Index
Accuracy . . . . .	±5% of full scale (Reference: Yankee UVB-1 at UV index 10 (Extremely High))
Cosine Response . . . . .	±4% (0° to 65° incident angle); 9% (65° to 85° incident angle)
Update Interval . . . . .	50 seconds to 1 minute (5 minutes when dark)
Current Graph Data . . . . .	Instant Reading and Hourly Average; Daily, Monthly High
Historical Graph Data . . . . .	Hourly Average, Daily, Monthly Highs
Alarm . . . . .	High Threshold from Instant Calculation

### **Wind**

#### **Wind Chill (Calculated)**

Resolution and Units . . . . .	1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C.
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Range	-110° to +130°F (-79° to +54°C)
Accuracy	±2°F (±1°C) (typical)
Update Interval	10 seconds
Source	United States National Weather Service (NWS)/NOAA
Equation Used	Osczevski (1995) (adopted by US NWS in 2001)
Variables Used	Instant Outside Temperature and 10-min. Avg. Wind Speed
Current Display Data	Instant Calculation
Current Graph Data	Instant Calculation; Hourly, Daily, Monthly Low
Historical Graph Data	Hourly, Daily, Monthly Lows
Alarm	Low Threshold from Instant Calculation

## Wind Direction

Display Resolution	16 points (22.5°) on compass rose, 1° in numeric display
Accuracy	±4°
Update Interval	2.5 seconds
Current Display Data	Instant (user-adjustable offset available)
Current Graph Data	Instant; 10-min. Dominant; Hourly, Daily, Monthly Dominant
Historical Graph Data	Past 6 10-min. Dominants on compass rose only; Hourly, Daily, Monthly Dominants

## Wind Speed

Resolution and Units	Measured in 1 mph. Other units are converted from mph and rounded to nearest 1 km/h, 0.1 m/s, or 1 knot
Range (large wind cups, included)	2 to 150 mph, 2 to 130 knots, 1 to 67 m/s, 3 to 241 km/h
Range (small wind cups; optional, not included)	3 to 175 mph, 3 to 150 knots, 1.5 to 79 m/s, 5 to 282 km/h
Update Interval	Instant Reading: 2.5 seconds, 10-minute Average: 1 minute
Accuracy (large wind cups, included)	±2 mph (2 kts, 3 km/h, 1 m/s) or ±5%, whichever is greater
Accuracy (small wind cups; optional, not included)	±3 mph (3 kts, 5 km/h, 1.5 m/s) or ±5%, whichever is greater
Maximum Cable Length	240' (73 m). Maximum wind speed reading decreases as length of cable from Anemometer to ISS increases. At 140' (42 m), maximum speed is 135 mph (60 m/s). At 240', the maximum is 100 mph.
Current Display Data	Instant
Current Graph Data	Instant; 10-minute and Hourly Average; Hourly High; Daily, Monthly, Yearly High with Direction of High
Historical Graph Data	10-min. and Hourly Averages; Hourly Highs; Daily, Monthly, Yearly Highs with Direction of Highs
Alarms	High Thresholds from Instant Reading and 10-minute

**Wireless Communications**

Transmit/Receive Frequency	US Models: 902-928 MHz FHSS, Overseas Models: 868.0 - 868.6 MHz FHSS.
ID Codes Available	8
Output Power	902-928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required 868.0 - 868.6 MHz FHSS: CE-certified, less than 8 mW, no license required
Range	
Line of Sight	up to 1000 feet (300 m)
Through Walls	200 to 400 feet (75 to 150 m)
Sensor Inputs	
RF Filtering	RC low-pass filter on each signal line

## Sensor Charts

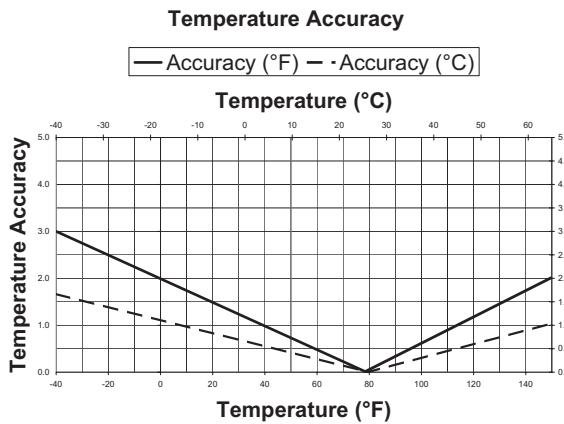


Figure 1. Temperature Accuracy

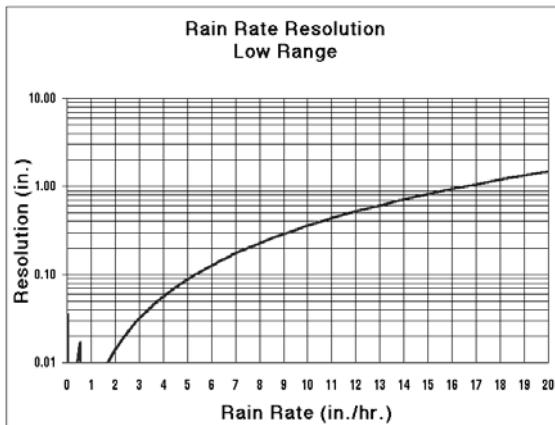


Figure 3. Low Range Rain Rate Resolution

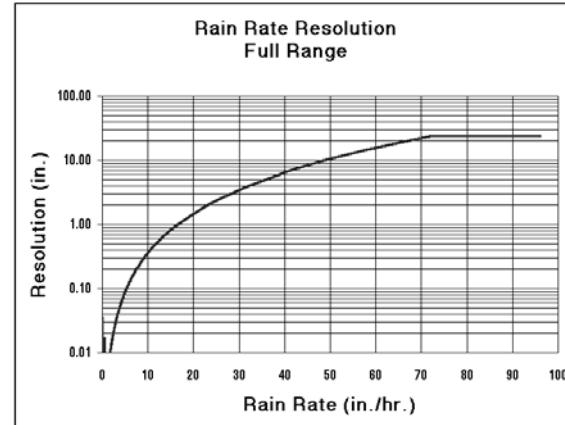


Figure 4. Full Range Rain Rate Resolution

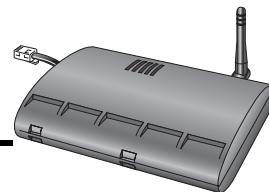
## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6152	17.0" x 11.0" x 13.0" (410 mm x 264 mm x 330 mm)	12.8 lbs. (5.8 kg)	011698 00722 6
6152EU			011698 00758 5
6152UK			011698 00759 2
6162	15.0" x 13.0" x 24.0" (378 mm x 327 mm x 594 mm)	13.3 lbs. (6.0 kg)	011698 00746 2
6162EU			011698 00752 3
6162UK			001698 00751 6
6153	15.0" x 13.0" x 24.0" (378 mm x 327 mm x 594 mm)	12.8 lbs. (5.8 kg)	011698 00750 9
6153EU			011698 00760 8
6153UK			001698 00761 5
6163	15.0" x 13.0" x 24.0" (378 mm x 327 mm x 594 mm)	13.3 lbs. (6.0 kg)	011698 00747 9
6163EU			011698 00762 2
6163UK			001698 00763 9



# Weather Envoy

## Wireless and Cabled Models



6316  
6316C

Vantage Pro2™

The Wireless Weather Envoy (# 6316) and Cabled Weather Envoy (# 6316C) provide a quick and easy way to get weather data onto your Windows 95 or later computer or Macintosh OS X computer using our WeatherLink software. WeatherLink allows you to log weather data, display graphs and plots on your computer, export weather data to a spreadsheet, and to upload weather information to the Internet.

The Weather Envoy includes sensors to measure inside temperature, inside humidity, and barometric pressure. It is intended to be used in conjunction with our Integrated Sensor Suite (ISS) to report outside temperature and humidity, rainfall, wind speed and direction. Using optional sensors, the Weather Envoy can also report solar and UV radiation. The Wireless Weather Envoy can be used in conjunction with our Wireless Temperature, Wireless Temperature and Humidity, and Wireless Leaf and Soil Moisture/Temperature stations. All wireless products communicate via FCC-certified, license-free transmitters and receivers. The Cabled Weather Envoy is connected directly to the ISS via a cable and cannot be used with any other sensor stations and cannot be used with the Vantage Pro2 console. The Cabled Weather Envoy may be powered by batteries or by the included AC-power adapter.

Please refer to the Wireless or Cabled Vantage Pro2 Weather Station Spec Sheets for detailed information on the Vantage Pro2 ISS data.

### General

Operating Temperature .....	+14° to +140°F (-10° to +60°C)
Storage Temperature .....	-5° to +158°F (-20° to +70°C)
Current Draw, Wireless .....	0.90 mA average, 20 mA peak, (plus 0.125 mA for each optional wireless transmitter in use) at 4 to 6 VDC
Current Draw, Cabled .....	10 mA average, 15 mA peak at 4 to 6 VDC
AC Power Adapter .....	5 VDC, 200 mA, regulated
Batteries .....	3 AA-cells
Battery Life, Wireless .....	up to 4 months
Battery Life, Cabled .....	up to 1 month
Connectors .....	Modular RJ-11
Cable Type .....	4-conductor, 26 AWG
Housing Material .....	UV-resistant PVC plastic
Dimensions (length x width x height) .....	6.5" x 1.5" x 3.75" (165 mm x 38 mm x 95 mm)
Weight (with batteries) .....	0.58 lbs. (0.26 kg)

### Communication (# 6316 Only)

Transmit/Receive Frequency .....	US Models: 902-928 MHz FHSS, Overseas Models: 868.0 - 868.6 MHz FHSS.
ID Codes Available .....	8
Output Power .....	902-928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required 868.0 - 868.6 MHz FHSS. CE-certified, less than 8 mW, no license required
Range	
Line of Sight .....	up to 1000 feet (300 m)
Through Walls .....	200 to 400 feet (75 to 150 m)

### Sensor Inputs

RF Filtering .....	RC low-pass filter on each signal line
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## Sensor Data From Envoy

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### Barometric Pressure (sensor located in Envoy)

Resolution and Units .....	Measured in 0.01" Hg. Other units are converted from Hg and rounded to nearest 0.1 mm, 0.1 hPa, 0.1mb.
Corrected Range .....	26.00" to 32.00" Hg, 660.0 to 810.0 mm Hg, 880.0 to 1080.0 hPa(mb)
Uncorrected Range .....	16.00" to 33.50" Hg, 406.0 to 850.0 mm Hg, 542.0 to 1130.0 hPa(mb)
Elevation Range .....	-1500' to +15,300' (-460 m to 4670 m). The console screen limits display of lower elevation to -999' when using feet as elevation unit.
Uncorrected Reading Accuracy .....	±0.03" Hg (±0.8 mm Hg, ±1.0 hPa(mb) (at room temperature)
Sea-Level Reduction Equation Used .....	United States Method employed prior to use of current "R Factor" method
Equation Source .....	Smithsonian Meteorological Tables
Equation Accuracy .....	±0.01" Hg (±0.3 mm Hg, ±0.3 hPa(mb)
Elevation Accuracy Required .....	±10' (3m) to meet equation accuracy specification
Overall Accuracy .....	±0.04" Hg (±1.0 mm Hg, ±1.4 hPa(mb)
Trend (change in 3 hours) .....	Change ±0.6" (2.0 hPa(mb, 1.5 mm Hg) = Rapidly Change ±0.2" (0.7hPa(mb, 0.5 mm Hg) = Slowly
Trend Indication .....	5 position arrow: Rising (rapidly or slowly), Steady, or Falling (rapidly or slowly)
Update Interval .....	15 minutes
Current and Historical Data .....	Based on WeatherLink display
Alarms .....	High Threshold from Current Trend for Storm Clearing (Rising Trend) Low Threshold from Current Trend for Storm Warning (Falling Trend)
Range for Rising and Falling Trend Alarms .....	0.01 to 0.25" Hg (0.1 to 6.4 mm Hg, 0.1 to 8.5 hPa(mb)

### Humidity

#### Inside Relative Humidity (sensor located in Weather Envoy)

Resolution and Units .....	1%
Range .....	0 to 100% RH
Accuracy .....	±5%
Update Interval .....	1 minute
Current and Historical Data .....	Based on WeatherLink display
Alarms .....	High and Low Threshold from Instant Reading

### Temperature

#### Inside Temperature (sensor located in console)

Resolution and Units .....	Current Data: 0.1°F or 1°F or 0.1°C or 1°C. °(nominal). Celsius is converted from Fahrenheit and rounded to the nearest 0.1° or 1°C. Historical Graph Data and Alarms: 1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C.
Range .....	+32° to +140°F (0° to +60°C)
Sensor Accuracy .....	±1°F (±0.5°C) typical
Update Interval .....	1 minute
Current and Historical Data .....	Based on WeatherLink display
Alarms .....	High and Low Thresholds from Instant Reading

### Clock

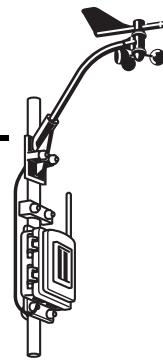
Resolution .....	1 minute
Units .....	Time: 12 or 24 hour format (user-selectable) Date: US or International format (user-selectable)
Accuracy .....	±8 seconds/month
Adjustments .....	
Time .....	Automatic Daylight Savings Time (for users in North America, Europe and Australia that observe it in AUTO mode, MANUAL setting available for all other areas)
Date .....	Automatic Leap Year

## Package Dimensions

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Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6316	12.0" x 7.0" x 3.0" (299 mm x 172 mm x 76 mm)	1.2 lbs. (0.56 kg)	011698 00749 3
6316EU			011698 00770 7
6316UK			011698 00771 4
6316C			011698 00757 8
6316CEU			011698 00789 9
6316CUK			011698 00790 5





The Anemometer Transmitter Kit for Wireless Vantage Pro2™ allows you to place the anemometer, included with your Integrated Sensor Suite (ISS), anywhere within range of your Vantage Pro2 console. The anemometer transmitter communicates directly with your wireless Vantage Pro2 console/receiver over any one of eight user-selectable ID codes. The transmitter kit is solar-powered with a battery backup and has a transmitting range of between 200' to 1000' (75 to 300 m) depending upon the environment.

## General

Operating Temperature	-40° to +150° F (-40° to +65° C)
Storage Temperature	-50° to +158° F (-45° to +70° C)
Supply Power	0.14 mA (average), 30 mA (peak) (from external power source)
Battery	CR123A 3-Volt Lithium cell
Battery Life	8 months without sunlight - greater than 2 years depending on solar charging
Solar Panel	0.5 Watts
Connector	Modular RJ-11
Housing Material	UV-resistant PVC plastic
Dimensions (length x width x height)	6.25" x 2.25" x 7.875" (159 mm x 58 mm x 200 mm)
Weight	1.04 lb. (.48 kg)

## Wireless Communications

Transmit/Receive Frequency	US Models: 902-928 MHz FHSS, Overseas Models: 868.0 - 868.6 MHz FHSS
ID Codes Available	8
Output Power	902-928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required 868.0 - 868.6 MHz FHSS: CE-certified, less than 8 mW, no license required
Range	
Line of Sight	up to 1000 feet (300 m)
Through Walls	200 to 400 feet (75 to 150 m)

## Sensor Output

### Wind Direction

Display Resolution	16 points (22.5°) on compass rose, 1° in numeric display
Accuracy	±4°
Update Interval	2.5 seconds

**Vantage Pro2™ Accessories****Wind Speed**

Resolution and Units . . . . . Measured in 1 mph. Other units are converted from mph and rounded to nearest 1 km/h, 0.1 m/s, or 1 knot

Range (large wind cups, included) . . . . . 2 to 150 mph, 2 to 130 knots, 1 to 67 m/s, 3 to 241 km/h

Range (small wind cups; optional, not included) . . . . . 3 to 175 mph, 3 to 150 knots, 1.5 to 79 m/s, 5 to 282 km/h

Update Interval . . . . . Instant Reading: 2.5 seconds, 10-minute Average: 1 minute

Accuracy (large wind cups, included) . . . . .  $\pm 2$  mph (2 kts, 3 km/h, 1 m/s) or  $\pm 5\%$ , whichever is greater

Accuracy (small wind cups; optional, not included) . . . . .  $\pm 3$  mph (3 kts, 5 km/h, 1.5 m/s) or  $\pm 5\%$ , whichever is greater

Maximum Cable Length . . . . . 240' (73 m). Maximum wind speed reading decreases as length of cable from Anemometer to ISS increases. At 140' (42 m), maximum speed is 135 mph (60 m/s). At 240', the maximum is 100 mph.

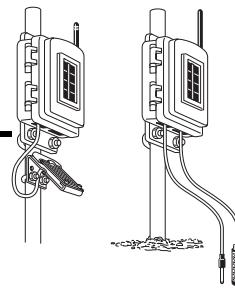
Alarms . . . . . High Thresholds from Instant Reading and 10-minute

**Package Dimensions**

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6332	12.0" x 7.00" x 3.0" (299 mm x 177 mm x 76 mm)	1.9 lbs. (0.9 kg)	011698 00739 4
6332OV			011698 00740 0

# Wireless Leaf & Soil Moisture/ Temperature Station

6345  
6345CS



## Vantage Pro2™ Accessories

The Wireless Leaf & Soil Moisture/Temperature Station for Vantage Pro2™ monitors up to three temperature-compensated Soil Moisture Sensors and two Leaf Wetness

Sensors anywhere within the transmission range of your wireless Vantage Pro2 console. The station communicates directly to your Wireless Vantage Pro2 console/receiver over any one of eight user-selectable ID codes, and has a transmitting range of between 200' to 1000' (75 to 300 m) depending upon the environment. The station is solar powered, and includes a battery backup. The soil moisture, temperature, and Leaf Wetness Sensors are optional and can be ordered to meet the needs of your application.

The Complete Wireless Soil Moisture/Temperature Station (# 6345CS) comes pre-packaged with four Soil Moisture Sensors and four temperature probes. The Wireless Leaf & Soil Moisture/Temperature station (# 6345) comes without any sensors, allowing you to customize the sensors used in correlation with the station.

### **Soil Moisture Sensors (# 6420)**

The Watermark® Soil Moisture Sensor is an indirect, calibrated method of measuring soil water. It is an electrical resistance type sensor. The Vantage Pro2 weather station converts the electrical resistance reading from the sensor into a calibrated reading of centibars of soil water suction. The Multi-Purpose Temperature Probe is a precision thermistor that produces a resistance change proportional to temperature. The temperature probe is used by the station to provide temperature compensation for the associated soil moisture reading.

The Watermark Soil Moisture Sensor is a product of the Irrometer Company, Inc.

### **Leaf Wetness Sensors (# 6440)**

The Leaf Wetness Sensor detects the presence of surface moisture. The sensor is an artificial-leaf electrical-resistance type. It consists of a sensing grid, low-voltage bi-polar excitation circuit, and conductivity-sensing circuit. The Vantage Pro2 console measures the conductivity across the grid and displays the result as a moisture level, scaled from 0 to 15. The user may select the threshold level at and above which moisture-hour totals are accumulated.

The sensing grid is a gold-plated etched circuit on an epoxy-glass substrate; the excitation and sense circuits are encapsulated in black epoxy. The included mounting bracket holds the sensor at a 45° angle to simulate a typical leaf position and to permit runoff of excess moisture; it may be mounted on a vertical post, pipe, or stake.

## **General**

Operating Temperature .....	-40° to +150°F (-40° to +65°C)
Storage Temperature .....	-50° to +158°F (-45° to +70°C)
Current Draw .....	0.14 mA (average), 30 mA (peak) (from external power source)
Battery .....	CR123A 3-Volt Lithium cell
Battery Life .....	8 months without sunlight - greater than 2 years depending on solar charging
Solar Panel .....	0.5 Watts
Housing Material .....	UV-resistant PVC plastic
Dimensions (length x width x height) .....	6.25" x 2.25" x 7.88" (158.75 mm x 57.15 mm x 200 mm)
Weight .....	1.08 lb. (.49 kg) (with battery, without sensors)

## **Sensors**

### **Leaf Wetness Sensor (# 6420)**

Sensor Type .....	Electrical resistance
Cable Type .....	4-conductor, 26 AWG
Connector .....	Modular connector (RJ-11)
Maximum Cable Length .....	200' (61 m) using 4-conductor 26 AWG cable

#### **Vantage Pro2™ Accessories**

Watermark Soil Moisture Sensor (# 6440)

Sensor Type ..... Electrical resistance  
Standard Cable ..... 15' (4.6 m) Watermark standard two-wire, stripped and tinned  
Maximum Cable Length ..... 18 AWG: 1000' (UF wire recommended)

## Multi-Purpose Temperature Probe (# 6470)

Sensor Type ..... Thermistor  
Standard Cable ..... 15' (4.6m) 22 AWG direct burial cable, stripped and tinned  
Maximum Cable Length ..... 24 AWG: 800' (244 m), 22 AWG: 1200' (365 m)

## Wireless Communications

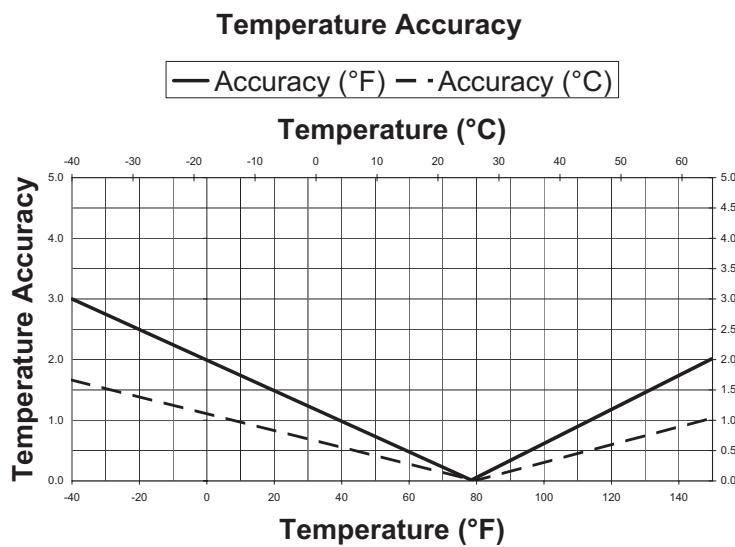
Transmit/Receive Frequency . . . . .	US Models: 902-928 MHz FHSS, Overseas Models: 868.0 - 868.6 MHz FHSS
ID Codes Available. . . . .	8
Output Power . . . . .	902-928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required 868.0 - 868.6 MHz FHSS: CE-certified, less than 8 mW, no license required
Range	
Line of Sight . . . . .	up to 1000 feet (300 m)
Through Walls . . . . .	200 to 400 feet (75 to 150 m)

## Sensor Output

Leaf Wetness	
Resolution	.....1
Range	.....0 to 15
Dry/Wet Threshold	.....User-selectable
Accuracy	.....±0.5
Update Interval	.....15 to 18 seconds
Soil Moisture (Watermark Soil Moisture Sensor)	
Resolution	.....1 cb (centibar)
Range	.....0 to 200 cb
Update Interval	.....62.5 to 75 seconds
Temperature	
Resolution and Units	.....1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range	.....-40° to +150°F (-40° to +65° C)
Sensor Accuracy	.....±1°F (±0.5°C) typical (See Chart)
Sensor Accuracy	.....±1°F (±0.5°C) up to 110°F (43°C), ±2°F (±1°C) over 110°F (43°C) (see Fig. 1)
Update Interval	.....62.5 to 75 seconds

## Temperature Accuracy Chart

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## Package Dimensions

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Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6345	11.75" x 6.75" x 3.00" (299 mm x 172 mm x 76 mm)	2.3 lbs. (1.1 kg)	011698 00795 0
6345OV			011698 00796 7
6345CS	11.75" x 6.75" x 6.00" (299 mm x 172 mm x 153 mm)	3.7 lbs. (1.7 kg)	
6345CSOV			



# Wireless Temperature Station

6372



## Vantage Pro2™ Accessories

The Wireless Temperature Station for Wireless Vantage Pro2™ allows you to place an extra temperature sensor anywhere within the transmission range of your wireless Vantage Pro2 console. The temperature station communicates directly to your Vantage Pro2 console/receiver over any one of eight user-selectable ID codes, and has a transmitting range of between 200' to 1000' (75 to 300 m) depending upon the environment. The temperature sensor is a precision thermistor that produces a resistance change proportional to temperature. It is battery powered.

Please refer to the WeatherLink® for Vantage Pro® and Vantage Pro2™ specification sheet for optional data logging and charting capabilities available for this product.

## General

Operating Temperature .....	-40° to +150°F (-40° to +65°C)
Storage Temperature .....	-50° to +158°F (-45° to +70°C)
Sensor Type .....	Thermistor
Current Draw .....	0.14 mA (average), 30 mA (peak) (from external power source)
Battery .....	CR123A 3-Volt Lithium cell
Battery Life .....	8 months
Housing Material .....	UV-resistant PVC plastic
Dimensions .....	6.25" x 2.25" x 7.875" (158.75 mm x 57.15 mm x 200 mm)
Weight .....	1.06 lb. (.49 kg)

## Wireless Communications

Transmit/Receive Frequency .....	US Models: 902-928 MHz FHSS, Overseas Models: 868.0 - 868.6 MHz FHSS
ID Codes Available .....	8
Output Power .....	902-928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required 868.0 - 868.6 MHz FHSS: CE-certified, less than 8 mW, no license required
Range	
Line of Sight .....	up to 1000 feet (300 m)
Through Walls .....	200 to 400 feet (75 to 150 m)

## Sensor Output

### Temperature

Outside Temperature (Air)	
Resolution and Units .....	1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C
Range .....	-40° to +150°F (-40° to +65°C)
Sensor Accuracy .....	±1°F (±0.5°C) typical (See Chart)
Update Interval .....	10 seconds
Alarms .....	High and Low Thresholds from Instant Reading

## Temperature Charts

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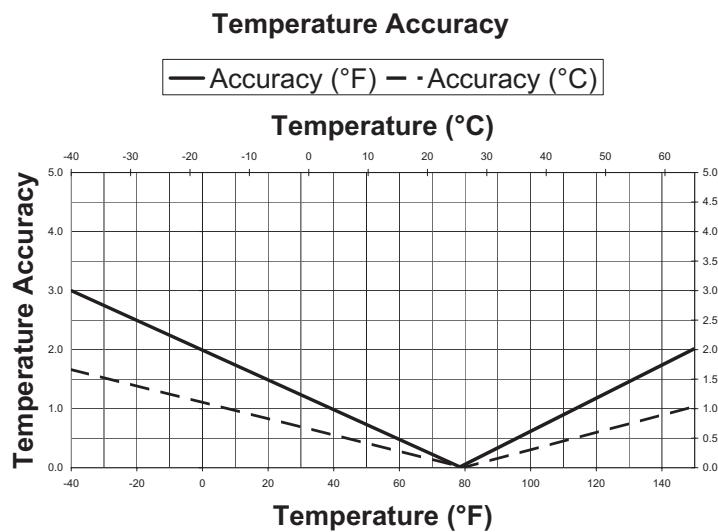


Figure 1. Temperature Accuracy

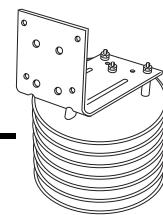
## Package Dimensions

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Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6372	11.75" x 7.00" x 3.00" (299 mm x 178 mm x 76 mm)	1.9 lbs. (0.9 kg)	011698 00741 7
6372OV			011698 00742 4

# Wireless Temperature/Humidity Station

With Passive Shielding



6382

## Vantage Pro2™ Accessories

The Wireless Temperature/Humidity Station measures relative humidity and air temperature. The passive solar radiation shield is made of a proprietary plastic designed for high thermal reflectance and low thermal conductivity. It can be used with any wireless Vantage Pro2™ weather station as well as all other compatible wireless stations.

The humidity sensor is a thin film capacitor element. A dielectric polymer layer absorbs water molecules from the air through a thin metal electrode, which causes a change in capacitance proportional to relative humidity. The temperature sensor is a precision thermistor that produces a resistance change proportional to temperature. The sensors are mounted next to one another in the sensor interface module (SIM) to ensure a close correlation between relative humidity and temperature readings. Relative humidity and temperature are used to calculate dew point.

The Wireless Temperature/Humidity Station includes temperature and humidity sensors, transmitter, and a passive solar radiation shield. Please refer to the WeatherLink® for Vantage Pro® and Vantage Pro2™ specification sheet for optional data logging and charting capabilities available for this product.

## General

Operating Temperature	-40° to +150° F (-40° to +65° C)
Storage Temperature	-50° to +158° F (-45° to +70° C)
Current Draw, Sensors & Transmitter only	0.14 mA (average), 30 mA (peak) (from external power source)
Battery: Sensors & Transmitter	CR-123 3-Volt Lithium cell
Battery Life	8 months
Sensor Type:	
Temperature	Thermistor
Relative Humidity	Film capacitor element
Housing Material	UV-resistant PVC plastic
Dimensions (length x width x height	7.50" x 8.50" x 6.00" (190 mm x 216 mm x 153 mm)
Weight	3.5 lbs. (1.6 kg)

## Wireless Communications

Transmit/Receive Frequency	US Models: 902-928 MHz FHSS, Overseas Models: 868.0 - 868.6 MHz FHSS
ID Codes Available	8
Output Power	902-928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required 868.0 - 868.6 MHz FHSS: CE-certified, less than 8 mW, no license required
Range	
Line of Sight	up to 1000 feet (300 m)
Through Walls	200 to 400 feet (75 to 150 m)

## Sensor Output

### Relative Humidity

Resolution and Units	1%
Range	1 to 100% RH
Accuracy	±3% (0 to 90% RH), ±4% (90 to 100% RH)
Drift	up to ±2% per year
Update Interval	50 seconds (depending on ID code)
Alarms	High and Low Threshold from Instant Reading

**Vantage Pro2™ Accessories****Temperature (Air)**

Resolution and Units ..... 1°F or 1°C. Celsius is converted from Fahrenheit and rounded to the nearest 1°C

Range ..... -40° to +150° F (-40° to +65° C)

Sensor Accuracy ..... ±1°F (±0.5°C) typical (see chart)

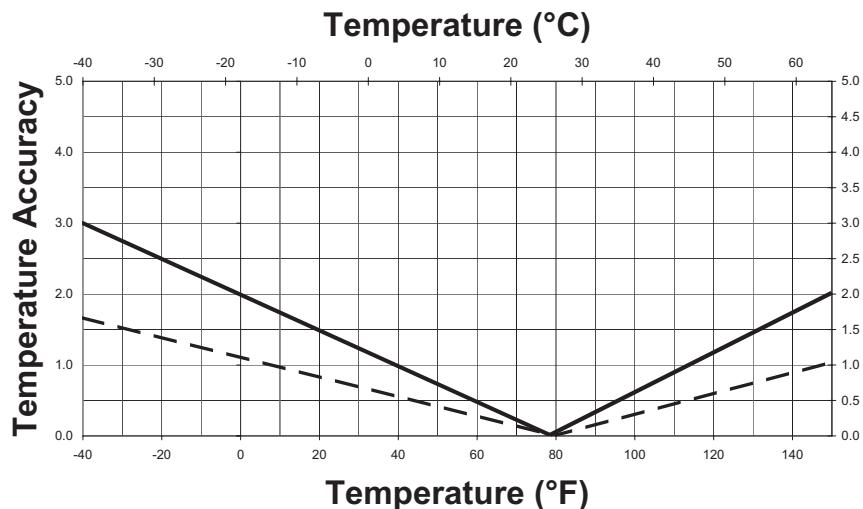
Radiation Induced Error ..... +2°F (1°C) at solar noon (insolation = 1040 W/m<sup>2</sup>, avg. wind speed 2 mph (1 m/s)) (reference: RM Young Model 43408 Fan-Aspirated Radiation Shield)

Update Interval ..... 10 seconds (depending on ID code)

Alarms ..... High and Low Thresholds from Instant Reading

**Temperature Chart****Temperature Accuracy**

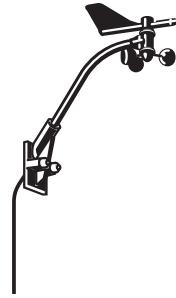
— Accuracy (°F) — - Accuracy (°C)

**Package Dimensions**

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6382	8.75" x 7.75" x 5.25" (223 mm x 197 mm x 134 mm)	3.5 lbs. (1.6 kg)	011698 00743 1
6382OV			011698 00744 8

# Anemometer

6410



## Vantage Pro2™ Accessories

The Anemometer includes both wind speed and wind direction sensors. Rugged components stand up to hurricane-force winds, yet are sensitive to a light breeze. Includes sealed bearings for long life. The range and accuracy specifications of this unit have been verified in wind-tunnel tests (information available upon request). A Davis Anemometer reported wind speeds of 175 miles per hour before its tower collapsed during hurricane Andrew, 1992. Digital filtering, with time constant as specified below, is applied to wind direction measurements. In areas where icing of the anemometer is a problem, the included Anemometer Drip Rings deflect water from the joint between moving parts.

### General

#### Sensor Type

Wind Speed..... Wind cups and magnetic switch

Wind Direction..... Wind vane and potentiometer

Attached Cable Length..... 40' (12 m)

Cable Type..... 4-conductor, 26 AWG

Connector..... Modular connector (RJ-11)

Maximum Cable Length..... 240' (73 m)

#### Material

Wind Vane and Control Head..... UV-resistant ABS

Wind Cups..... Polycarbonate

Anemometer Arm..... Black-anodized aluminum

Dimensions (length x width x height)..... 15.0" x 1.5" x 18.0" (381 mm x 38 mm x 457 mm)

Weight..... 1 lbs. 4 oz. (1.332 kg)

### Sensor Output

#### Wind Direction

Display Resolution..... 16 points (22.5°) on compass rose, 1° in numeric display

Accuracy..... ±4°

Update Interval..... 2.5 to 3 seconds (depending on transmitter ID)

#### Wind Speed

Resolution and Units..... Measured in 1 mph. Other units are converted from mph and rounded to nearest 1 km/h, 0.1 m/s, or 1 knot

Range (large wind cups, included)..... 2 to 150 mph, 2 to 130 knots, 1 to 67 m/s, 3 to 241 km/h

Range (small wind cups; optional, not included)..... 3 to 175 mph, 3 to 150 knots, 1.5 to 79 m/s, 5 to 282 km/h

Update Interval..... Instant Reading: 2.5 seconds, 10-minute Average: 1 minute

Accuracy (large wind cups, included)..... ±2 mph (2 kts, 3 km/h, 1 m/s) or ±5%, whichever is greater

Accuracy (small wind cups; optional, not included)..... ±3 mph (3 kts, 5 km/h, 1.5 m/s) or ±5%, whichever is greater

Maximum Cable Length..... 240' (73 m). Maximum wind speed reading decreases as length of cable from Anemometer to ISS increases. At 140' (42 m), maximum speed is 135 mph (60 m/s). At 240', the maximum is 100 mph.

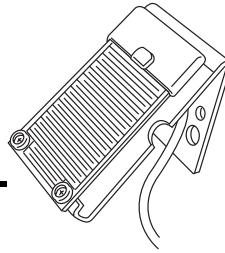
### Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6410	17.75" x 10.50" x3.00" (451 mm x 267 mm x 76 mm)	2.0 lbs. (.9 kg)	011698 00237 5



# Leaf Wetness Sensor

For the Wireless Leaf & Soil Moisture/  
Temperature Station (# 6345)



6420

Vantage Pro2™ Accessories

The Leaf Wetness Sensor detects the presence of surface moisture. The sensor is an artificial-leaf electrical-resistance type. It consists of a sensing grid, low-voltage bi-polar excitation circuit, and conductivity-sensing circuit. The Vantage Pro2 console measures the conductivity across the grid and displays the result as a moisture level, scaled from 0 to 15. The user may select the threshold level at and above which moisture-hour totals are accumulated.

The sensing grid is a gold-plated etched circuit on an epoxy-glass substrate; the excitation and sense circuits are encapsulated in black epoxy. The included mounting bracket holds the sensor at a 45° angle to simulate a typical leaf position and to permit runoff of excess moisture; it may be mounted on a vertical post, pipe, or stake, or on the Sensor Mounting Arm.

## General

Sensor Type .....	Artificial leaf electrical resistance
Excitation .....	Bipolar (3V nominal) built-in
Time Constant .....	2 seconds
Attached Cable Length .....	40' (12 m)

Note: Increasing the cable length above the recommended maximum cable length causes measurement error in the form of lower leaf wetness readings.

Cable Type .....	4-conductor, 26 AWG
Connector .....	Modular connector (RJ-11)
Recommended Maximum Cable Length (see Note 1) .....	200' (61 m) using 4-conductor 26 AWG cable
Material	
Substrate .....	Glass-reinforced, ceramic-filled laminate
Grid .....	1 oz. copper, nickel, and 50 $\mu$ inch gold plate
Mounting Bracket .....	White powder-coated aluminum
Dimensions (length x width x height)	
Leaf Wetness Sensor .....	4.00" x 2.25" x 2.25" (102 mm x 58 mm x 58 mm)
Sensor Area .....	4.4 in <sup>2</sup> (28 cm <sup>2</sup> )
Weight .....	13 oz. (.4 kg)

## Sensor Output

Resolution .....	1
Range .....	0 to 15
Dry/Wet Threshold .....	User-selectable
Accuracy .....	$\pm 0.5$
Update Interval .....	62.5 to 75 seconds

## Input/Output

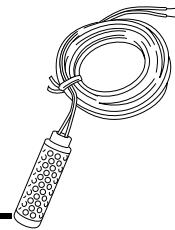
Supply Voltage and Current .....	100 $\mu$ A (typical) @ 3 VDC
Output .....	2.5 to 3 VDC
Connections	
Yellow .....	3 VDC
Red .....	Ground
Green .....	Output

## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6420	5.75" x 4.25" x 3.25" (146 mm x 108 mm x 83 mm)	1.0 lbs. (.5 kg)	011698 00238 2

# Soil Moisture Sensor

For Wireless Soil Moisture/Temperature Station (# 6345)



**6440**

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## Vantage Pro2™ Accessories

The Watermark® Soil Moisture Sensor is an indirect, calibrated method of measuring soil water content. It is an electrical resistance type sensor. The Soil Moisture/Temperature Station converts the electrical resistance reading from the sensor into a calibrated reading of centibars of soil water suction with a range from 0 to 200 centibars.

The Watermark Soil Moisture Sensor is a product of the Irrrometer Company, Inc.

### General

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Sensor Type .....	Electrical resistance
Attached Cable Length .....	15' (4.6 m)
Cable Type .....	Watermark standard, two-wire, wires stripped and tinned
Maximum Cable Length .....	1000' (300 m) (18 AWG UF recommended)
Housing Dimensions .....	7/8" diameter x 3" (22 mm diameter x 76 mm)
Weight .....	3.6 oz. (103 g)

### Sensor Output

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Resolution.....	1 cb
Range.....	0 to 200 cb
Update Interval .....	62.5 to 75 seconds

### Package Dimensions

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Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6440	6.00" x 5.63" x 1.25" (152 mm x 143 mm x 32 mm)	9 oz. (.3 kg)	011698 00330 3





The Solar Radiation Sensor, or solar pyranometer, measures global radiation, the sum at the point of measurement of both the direct and diffuse components of solar irradiance. The sensor's transducer, which converts incident radiation to electrical current, is a silicon photodiode with wide spectral response. From the sensor's output voltage, the console calculates and displays solar irradiance. It also integrates the irradiance values and displays total incident energy over a set period of time.

The outer shell shields the sensor body from thermal radiation and provides an airflow path for convection cooling of the body, minimizing heating of the sensor interior. It includes a cutoff ring for cosine response, a level indicator, and fins to aid in aligning the sensor with the sun's rays. The space between the shield and the body also provides a run-off path for water, greatly reducing the possibility of rain- or irrigation-water entrapment. The diffuser is welded to the body for a weather-tight seal; it provides an excellent cosine response. The transducer is an hermetically-sealed silicon photodiode; the included amplifier converts the transducer current into 0 to +2.5 VDC. Spring-loaded mounting screws, in conjunction with the level indicator, enable rapid and accurate levelling of the sensor. Each sensor is calibrated against a secondary standard which is calibrated periodically against an Eppley Precision Spectral Pyranometer in natural daylight.

The Solar Radiation Sensor is included with the Vantage Pro2 Plus and is optional on the Vantage Pro2.

Please refer to the WeatherLink® for Vantage Pro® and Vantage Pro2™ specification sheet for optional data logging and charting capabilities available for this product.

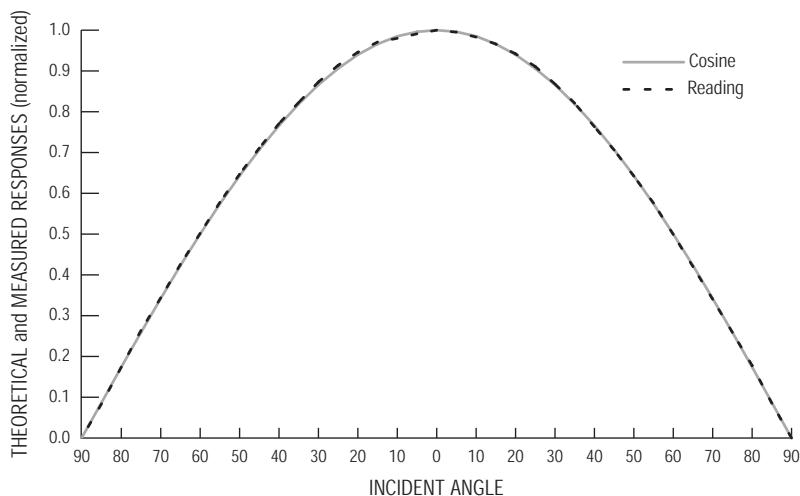
## General

Operating Temperature	.....	-40° to +150° F (-40° to +65° C)
Storage Temperature	.....	-50° to +158°F (-45° to +70°C)
Transducer	.....	Silicon photodiode
Spectral Response (10% points)	.....	400 to 1100 nanometers
Cosine Response		
Percent of Reading	.....	±3% (0° to ±70° incident angle); ±10% (±70° to ±85° incident angle)
Percent of Full Scale	.....	±2% (0° to ±90°)
Supplied Cable Length	.....	3' (0.9 m)
Cable Type	.....	4-conductor, 26 AWG
Connector	.....	Modular RJ-11
I/O Specifications		
Green wire	.....	Output (0 to +3VDC); 1.67 mV per W/m <sup>2</sup>
Red & Black wires	.....	Ground
Yellow wire	.....	+3 VDC ±10%; 1mA (typical)
Temperature Coefficient	.....	+0.067% per °F (+ 0.12% per °C)
Reference temperature	.....	77°F (25°C)
Correction per degree above reference temp	.....	-0.067% of reading per °F (-0.12% per °C)
Correction per degree below reference temp	.....	+0.067% of reading per °F (+0.12% per °C)
Housing Material	.....	UV-resistant PVC plastic
Dimensions (Length x Width x Height)	.....	2.00" x 2.75" x 2.25" (51 mm x 70 mm x 57 mm)
Weight	.....	0.5 lbs. (226 g)

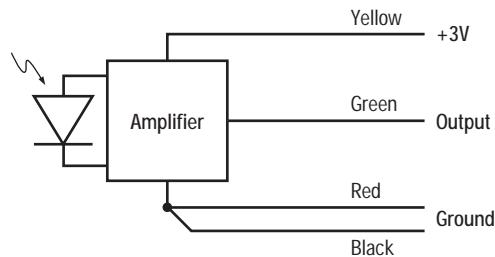
## Sensor Output

Resolution and Units .....	1 W/m <sup>2</sup>
Range .....	0 to 1800 W/m <sup>2</sup>
Accuracy .....	±5% of full scale (Reference: Eppley PSP at 1000 W/m <sup>2</sup> ) plus 45 W/m <sup>2</sup> per 100' (30 m) of additional cable
Drift .....	up to ±2% per year
Update Interval .....	50 seconds to 1 minute (5 minutes when dark)

## Cosine Response (typical)



## Connections



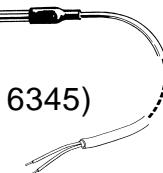
## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6450	6.00" x 4.25" x 3.25" (152 mm x 108 mm x 83 mm)	.9 lbs (.5 kg)	011698 00240 5

# Multi-Purpose Temperature Probe

For the Wireless Leaf & Soil Moisture/Temperature Station (# 6345)

**6470**



## Vantage Pro2™ Accessories

The Multi-Purpose Temperature Probe is for use with the Vantage Pro2 Wireless Soil Moisture/Temperature Station. The probe is designed to measure soil temperature in order to provide temperature compensation for the Watermark Soil Moisture Sensor.

The sensor is a precision platinum wire thermistor which produces a resistance change proportional to temperature. It is epoxy-encapsulated in a 316 alloy stainless steel body with vinyl strain relief. The 22 AWG direct burial cable is resistant to damage from pests, moisture or UV.

To ensure accurate readings when measuring outdoor air temperature, the Multi-Purpose Temperature Probe should be shielded from direct sunlight and other sources of reflected or radiated heat. We recommend the use of the Radiation Shield (#7714) for this purpose.

## General

Sensor Type (see Charts) . . . . .	Platinum wire thermistor
Time Constant	
In Still Air . . . . .	100 seconds
In Liquid . . . . .	28 seconds
Attached Cable Length . . . . .	
15' (4.6 m)	
Cable Type . . . . .	
22 AWG direct burial cable, wires stripped and tinned	
Recommended Maximum Cable Length (see Note 1)	
24 AWG Shielded Cable . . . . .	800' (242 m)
22 AWG Shielded Cable . . . . .	1,200' (260 m)

Note: There is no absolute maximum cable length. Increasing the cable length above the recommended maximum length causes an increased measurement error at a rate of approximately  $+0.24^{\circ}\text{F}$  ( $+0.13^{\circ}\text{C}$ ) per 100' (30 m) of 22 AWG cable.

Housing Material . . . . .	316 alloy stainless steel housing with vinyl strain relief
Housing Dimensions . . . . .	0.312" diameter x 2.5" long (8 mm diameter x 64 mm long)
Weight . . . . .	4.5 oz. (128 g)

## Sensor Output

Resolution and Units . . . . .	1°F or 1°C (user-selectable) Historical Graph Data and Alarms: 1°F or 1°C (user-selectable)
Range . . . . .	-40° to +150°F (-40° to +65°C)
Sensor Accuracy . . . . .	±1°F (±0.5°C) typical
Update Interval . . . . .	62.5 to 75 seconds

## Input/Output Connections

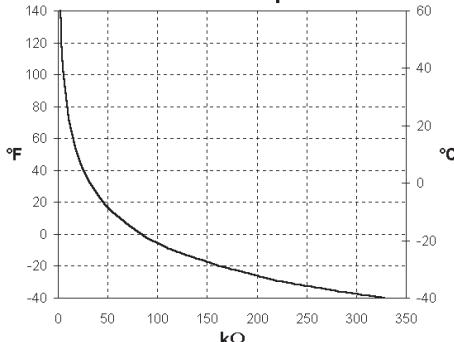
Black . . . . .	Common
White . . . . .	Temperature (variable resistance to common)

## Charts

The chart and graph on the left show the resistance of the sensor. The chart on the right shows the cable-induced error of an un-calibrated sensor using 100' (30 m) of cable.

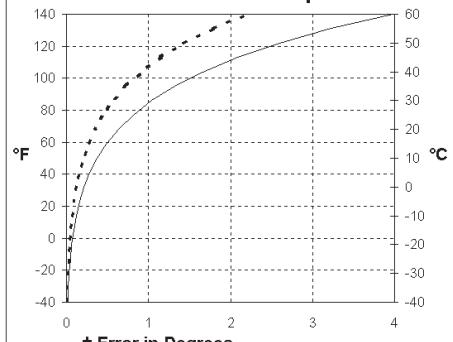
°F	°C	kΩ
-40	-40	326.400
-31	-35	237.700
-22	-30	173.900
-13	-25	128.500
-4	-20	95.890
5	-15	72.230
14	-10	54.890
23	-5	42.070
32	0	32.510
41	5	25.310
50	10	19.860
59	15	15.690
68	20	12.490
77	25	10.000
86	30	8.060
95	35	6.536
104	40	5.331
113	45	4.373
122	50	3.606
131	55	2.989
140	60	2.490

**Resistance vs. Temperature**



*Sensor Resistance Readings*

**Maximum Error vs. Temperature**



*Cable-Induced Temperature Error*

## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6470	5.50" x 4.50" x 1.50" (140 mm x 115 mm x 38 mm)	6.0 oz. (.2 kg)	011698 00241 2



The UV Sensor measures the sunburning portion of the UV spectrum. Its spectral response matches very closely the Erythema Action Spectrum (EAS), defined by McKinlay and Diffey (1987) and adopted by the Commission Internationale de l'Eclairage (C.I.E.) as the standard

representation of the human skin's sensitivity to UV radiation. The sensor measures global solar UV irradiance, the sum of the components of solar UV transmitted directly and those scattered in the atmosphere. Scattered UV is a major portion of global irradiance.

The transducer is a semiconductor photodiode that responds only to radiation in the region of interest. The diffuser provides an excellent cosine response. With multiple hard-oxide coatings, the interference filter provides the Erythema Action spectral response. It is stable in the presence of heat and humidity. The outer shell shields the sensor from thermal radiation and provides a path for convection cooling of the body, minimizing heating of the sensor interior. It provides a cutoff ring for cosine response, a level indicator, and fins to aid in aligning the sensor with the sun's rays. Spring-loaded mounting screws, in conjunction with the level indicator, enable rapid and accurate levelling of the sensor. Each sensor is calibrated against a Yankee Environmental Systems' Ultraviolet Pyranometer, model UVB-1, in natural summer daylight.

The UV Sensor is optional on Vantage Pro2 weather stations. It is standard on the Vantage Pro2 Plus.

Please refer to the WeatherLink® for Vantage Pro® and Vantage Pro2™ specification sheet for optional data logging and charting capabilities available for this product.

## General

Operating Temperature .....	-40° to +150° F (-40° to +65° C)
Storage Temperature .....	-50° to +158°F (-45° to +70°C)
Transducer .....	Semiconductor photodiode
Spectral Response .....	280 to 360 nm (Erythema Action Spectrum)
Cosine Response .....	±4% of reading (0° to 65° incident angle); ±9% of reading (65° to 85° incident angle)
Supplied Cable Length .....	3' (0.9 m)
Cable Type .....	4-conductor, 26 AWG
Connector .....	Modular RJ-11
I/O Specs	
Green wire.....	Output (0 to 2.5VDC); 150 mV per UV Index, 364 mV per MED/hour
Black & Red wires .....	Ground
Yellow wire .....	+3V ±10%, 2.4 mA
Housing Material .....	UV-resistant ABS plastic
Dimensions (length x width x height) .....	2" x 2.75" x 2.25" (51 mm x 70 mm x 57 mm)
Weight .....	0.5 lbs. (226 g)

## Sensor Output

### Ultra Violet (UV) Radiation Dose

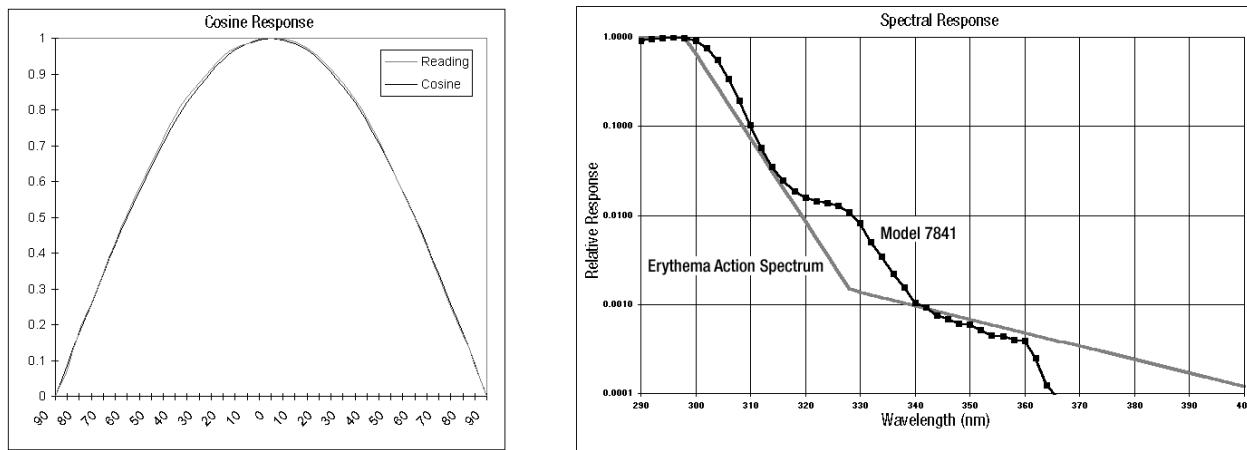
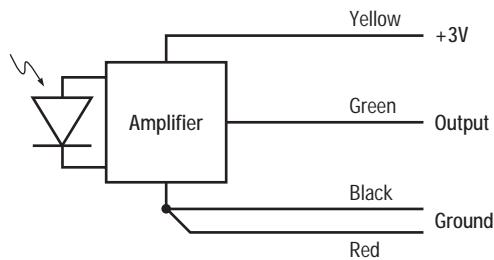
Resolution and Units .....	0.1 MEDs to 19.9 MEDs; 1 MED above 19.9 MEDS
Range .....	0 to 199 MEDs
Accuracy .....	±5% of daily total
Drift .....	up to ±2% per year
Update Interval .....	50 seconds to 1 minute (5 minutes when dark)

### Ultra Violet (UV) Radiation Index

Resolution and Units .....	0.1 Index
Range .....	0 to 16 Index
Accuracy .....	±5% of full scale (Reference: Yankee UVB-1 at UV Index of 10 [extremely high]) plus 0.5 UV Index per 100' (30 m) of additional cable

**Vantage Pro2™ Accessories**

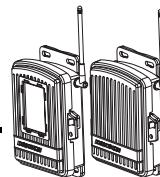
Cosine Response .....  $\pm 4\%$  (0° to 65° incident angle); 9% (65° to 85° incident angle)  
 Update Interval ..... 50 seconds to 1 minute (5 minutes when dark)

**Cosine and Spectral Responses (typical)****Connections****Package Dimensions**

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6490	6.00" x 4.25" x 3.25" (153 mm x 108 mm x 83 mm)	16 oz. (.5 kg)	011698 00243 6

# Wireless Repeater

AC and Solar Powered



7626  
7627

## Vantage Pro2™ Accessories

The Wireless Repeater receives data from any compatible transmitter and re-transmits it to any compatible Vantage Pro2 receiver. The repeater extends the transmission range and improves reception between the transmitter and the receiver.

Each repeater has a transmitting and receiving range of between 200' to 1000' (75 to 300 m) depending upon the environment. The repeater can listen for up to eight different transmitter signals and can pass those signals on to another repeater or to any number of receivers.

AC-powered repeaters (# 7626) include an AC-power adapter and a battery. Solar-powered repeaters (# 7627) include a solar power panel, regulator, and battery.

### General

Operating Temperature .....	-40° to +150°F (-40° to +65°C)
Storage Temperature .....	-40° to +158°F (-45° to +70°C)
Current Draw .....	0.3 mA (with 1 ID)
AC-Power Adapter (7626 only) .....	5 vdc, 200 ma regulated
Primary Power Source (7627 only) .....	Solar Power
Secondary Power Source .....	Battery back-up
Batteries .....	CR 123A 3-volt lithium battery

Battery Life Estimates (with no solar or AC power input):

# of IDs <sup>†</sup>	Estimated Life Expectancy (Months)
1	4
4	1.5
8	<1

<sup>†</sup>Both received directly by the repeater and those IDs repeated from the previous repeater in a chain

Note: Battery life in excess of two years is expected with normal solar input.

Solar Panel .....	0.5 Watts
Housing Material .....	UV-resistant PVC plastic
Dimensions (Listed by length x width x height) .....	6.3" x 2.3" x 7.9" (159 mm x 57 mm x 200 mm)
Weight .....	
Repeater Only (AC-powered) .....	1.2 lbs. (.54 kg)
Repeater Only (Solar-powered) .....	1.2 lbs. (.54 kg)

### Transmit Interval

Repeater Transmit Interval .....

2.5625 - 3.0000 seconds per ID, dependent on ID.

## Wireless Communication (US models)

Transmit/Receive Frequency	902-928 MHz FHSS (Frequency Hopping Spread Spectrum)
ID Codes Available	8
Output Power	902-928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required
Range	
Line of Sight	Up to 1000 feet (300 m)
Through Walls	Typical 200 to 400 feet (75 to 150 m)

## Wireless Communication (OV, EU, UK models)

Transmit/Receive Frequency	868.0 - 868.6 MHz FHSS (Frequency Hopping Spread Spectrum)
ID Codes Available	8
Output Power	868.0 - 868.6 MHz FHSS. CE-certified, less than 8 mW, no license required. No more than four transmitter IDs to comply with the EN 300 220 regulation.
Range	
Line of Sight	Up to 1000' (300 m)
Through Walls	Typical 200 to 400' (75 to 150 m)

## Package Dimensions

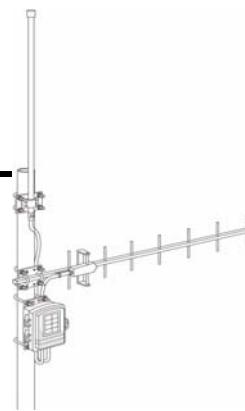
Product #	Package Dimensions (Width x Height x Depth)	Package Weight	UPC Codes
7626	11.75" x 3.00" x 7.00" (299 mm x 178 mm x 76 mm)	1.8 lbs. (0.83 kg)	011698 00317 4
7626EU			011698 00318 1
7626UK			011698 00319 8
7627			011698 00320 4
7627OV			011698 00322 1

# Long-Range Wireless Repeater

AC and Solar Powered

7653

7654



## Vantage Pro2™ Accessories

Long-Range Wireless Repeaters work in much the same way as the Vantage Pro2 Wireless Repeaters (# 7626, 7627), but extend the range and reception between a transmitting station and a receiver by up to 10 times that of the standard wireless repeater.

The Long-Range Wireless Repeater (US Version only, see note below) works in conjunction with two external antennas (# 7656, 7660), one for receiving and one for transmitting, to retransmit data over greater distances than a wireless repeater with the standard dipole antenna. Transmission distances vary depending on the antennas selected and how they are used in a network. The Long-Range Wireless Repeater can listen for up to eight different transmitter signals and can pass those signals on to another repeater or to any number of receivers.

AC-powered long-range repeaters (# 7653) include an AC-power adapter and battery. Solar-powered repeaters (# 7654) include a solar power panel, regulator and battery. The external Omni-direction (# 7656) and Yagi (# 7660) antennas used in conjunction with the long-range repeater should be purchased separately.

**Note:** Davis Instruments sells FCC Type approved antennas in conjunction with the long-range repeater. These antennas are available for US customers only. US customers must use these antennas. Overseas customers are responsible for procuring their own long-range antennas for use with the Long-Range Wireless Repeater that comply with local regulations. These transmitting antennas have an 8 dBi gain limit (the receiving antennas have no gain limitations). There is a limit of no more than four transmitter IDs to comply with the EN 300 220 regulation for all overseas customers.

## General

Operating Temperature	-40° to +150°F (-40° to +65°C)
Storage Temperature	-40° to +158°F (-45° to +70°C)
Current Draw	0.3 ma (with 1 ID)
AC-Power Adapter (# 7653 only)	5 vdc, 200 ma regulated
Primary Power Source (# 7654 only)	Solar Power
Secondary Power Source	Battery back-up
AC-Power Adapter (AC-powered only)	5 VDC
Batteries	CR 123A 3-volt lithium battery

Battery Life Estimates (with no solar or AC power input):

# of IDs <sup>†</sup>	Estimated Life Expectancy (Months)
1	4
4	1.5
8	<1

<sup>†</sup>Both received directly by the repeater and those IDs repeated from the previous repeater in a chain.

**Note:** Battery life in excess of two years is expected with normal solar input.

Solar Panel	0.5 Watts
Antenna Connectors (US Versions only)	Reverse-polarity TNC female
Antenna Connectors (OV, EU, UK models)	TNC Female
Housing Material	UV-resistant PVC plastic
Dimensions (Listed by length x width x height)	
Wireless repeater only (Both Models)	6.3" x 2.3" x 7.9" (159 mm x 57 mm x 200 mm)
Weight	
Repeater (AC-powered)	1.2 lbs. (.54 kg)
Repeater (Solar-powered)	1.2 lbs. (.54 kg)

## Transmit Interval

Repeater Transmit Interval ..... 2.5625 - 3.0000 seconds per ID.

## Wireless Communication (US models)

Transmit/Receive Frequency ..... 902-928 MHz FHSS (Frequency Hopping Spread Spectrum)

ID Codes Available ..... 8

Output Power ..... 902-928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required

Type	Gain
Omnidirectional Antenna (# 7655)	5 dBi
Yagi Antenna (# 7660)	11 dBi

Range:

Antenna Combination	Total Multiplier	Maximum Transmission Distance <sup>**</sup>
Dipole—Dipole	1	1000' (300 m)
Dipole—Omni	1.58	1580' (480 m)
Dipole—Yagi	3.16	3160' (960 m)
Omni—Omni	2.5	2500' (762 m)
Omni—Yagi	5	5000' (1542 m)
Yagi—Yagi	10	10000' (3048 m)

<sup>\*\*</sup>Typical distance will be less. Outdoors, line of sight with minor obstructions or interference, typical distance is about 0.50 to 0.80 times the maximum. Through walls or in areas with high RF interference, typical distance may be as low as 0.20 to 0.40 times the maximum.

## Wireless Communication (OV, EU, UK models)

Transmit/Receive Frequency ..... 868.0 - 868.6 MHz FHSS (Frequency Hopping Spread Spectrum)

ID Codes Available ..... 8

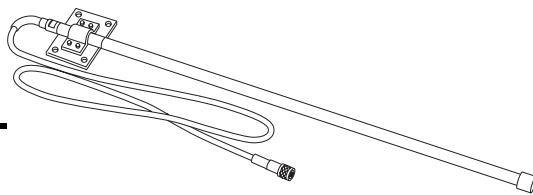
Output Power ..... 868.0 - 868.6 MHz FHSS. CE-certified, less than 8 mW, no license required. No more than four transmitter IDs to comply with the EN 300 220 regulation. There is an 8 dBi gain limit for the transmitting antenna.

Range

Line of Sight ..... up to 1.5 km (5000')

## Package Dimensions

Product #	Package Dimensions (Width x Height x Depth) Not Including Antennas	Package Weight	UPC Codes
7653			011698 00825 4
7653EU			011698 00826 1
7653UK			011698 00827 8
7654			011698 00828 5
7654OV	11.75" x 3.00" x 7.00" (299 mm x 178 mm x 76 mm)	1.8 lbs. (0.9 kg)	011698 00829 2



## Vantage Pro2™ Accessories

The Long-Range Omni Antenna is installed in conjunction with the US version of the Long-Range Wireless Repeater (# 7653, 7654) to retransmit data over greater distances than a wireless repeater with a dipole antenna. The Long-Range Wireless Repeater requires two antennas, one for acquiring weather station data and the other for re-transmitting the data.

The Omni Antenna is a standard 5 dBi omni-directional antenna that comes equipped with an integrated Reverse Polarity TNC Male Connector which connects to the Long-Range Wireless Repeater connector.

**Note:** Overseas customers are responsible for procuring their own long-range antennas for use with the long-range wireless repeater that comply with local regulations. The antenna must have a TNC Male Connector to comply with the long-range wireless repeater connectors.

## Specifications

Operating Temperature .....	-40° to +150°F (-45° to +70°C)
Storage Temperature .....	-40° to +150°F (-45° to +70°C)
Dimensions (Listed by length: Diameter = 1.5" (38 mm)) .	24.00" (610 mm)
Weight .....	1.3 lbs. (.54 kg)
Transmit/Receive Frequency.....	902-928 MHz
Gain .....	5 dBi
Input Return Loss .....	-14 dB
Vertical Beam width .....	36 degrees
Connector Cable Length .....	48"

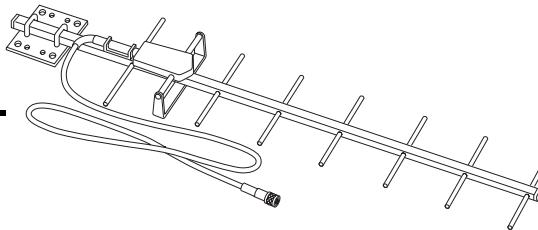
## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7656	38.00" x 4.50" x 4.00" (966 mm x 115 mm x 102 mm)	1.4 lbs. (0.7 kg)	011698 00832 2



# Yagi Antenna

7660



## Vantage Pro2™ Accessories

The Long-Range Yagi Antenna is installed in conjunction with the Long-Range Wireless Repeater to retransmit data over greater distances than a wireless repeater with a dipole antenna. The Long-Range Wireless Repeater requires two antennas, one for acquiring weather station data and the other for re-transmitting the data. The Yagi Antenna can be paired with another Yagi Antenna or an Omni Antenna (#7656) depending on your installation needs.

The Yagi Antenna is a standard 11 dBi directional antenna that comes equipped with an integrated Reverse Polarity TNC Male Connector which connects to the Long-Range Wireless Repeater connector.

**Note:** Overseas customers are responsible for procuring their own long-range antennas for use with the long-range wireless repeater that comply with local regulations. The antenna must have a TNC Male Connector to comply with the long-range wireless repeater connectors.

## Specifications

Operating Temperature	-40° to +150°F (-45° to +70°C)
Storage Temperature	-40° to +150°F (-45° to +70°C)
Dimensions (Listed by length: Diameter = 6.0" (152 mm)	19.70" (500 mm)
Weight	1.9 lbs. (.70 kg)
Transmit/Receive Frequency	902-928 MHz
Gain	11 dBi
Input Return Loss	-14 dB
Beam width	±25 degrees
Connector Cable Length	48"

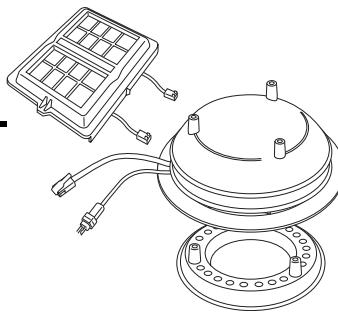
## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7660	37.50" x 8.00" x 2.50" (953 mm x 204 mm x 64 mm)	3.9 lbs. (1.8 kg)	011698 00831 5



# Daytime Fan-Aspirated Radiation Shield Kit

7747



## Vantage Pro2™ Accessories

The Daytime Fan-Aspirated Shield Kit can be installed on any Vantage Pro2 standard ISS model to provide even more accurate temperature and humidity readings. The kit contains a solar-powered fan that draws outside air over the temperature and humidity sensors to reduce the effects of daytime radiation on temperature and humidity readings. The solar-powered fan runs during the day. Since there is no backup battery, the fan will cease running when night falls and the effects of the radiation are minimal.

The kit includes fan, solar panel, additional radiation shield places, and hardware.

Please refer to the WeatherLink for Vantage Pro2 Spec Sheet for optional data logging and charting capabilities available for this product.

## General

Operating Temperature	.....	-40° to +150° F (-40° to +65° C)
Storage Temperature	.....	-50° to +158° F (-45° to +70° C)
Radiation Induced Error	.....	+1.0° F (0.5° C) at solar noon (insolation = 1040 W/m <sup>2</sup> , avg. wind speed ≤ 2 mph (1 m/s)) (reference: RM Young Model 43408 Fan-Aspirated Radiation Shield)
Housing Material	.....	UV-resistant plastic

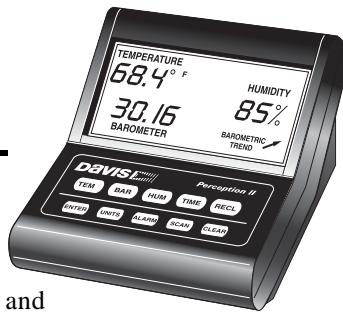
## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7747	12.00" x 10.00" x 6.00" (305 mm x 254 mm x 153 mm)	2.7 lbs. (1.2 kg)	011698 00786 8



# Perception II® Station

7400



## Perception and Wizard Stations

The Perception II station features the following: inside temperature and humidity sensors, barometer, and console. The console provides A/D conversion, calculations, and data display. A DC-power adapter is included. The WeatherLink, an optional feature, provides data logging and a serial interface to a computer.

## General

Operating Temperature .....	-5° to 140° F (-20° to 60° C)
Display Temperature .....	32° to 140° F (0° to 60° C)
Supply Power (adapter included) .....	16 mA (typical) at 10 to 16 V (100 mA when display is illuminated)
Housing Material .....	Black ABS plastic
Display Type .....	LCD
Dimensions	
Console .....	5.25" x 5.4" x 3.0" (133 mm x 137 mm x 76 mm)
Display .....	4.4" x 1.9" (112 mm x 48 mm)
Weight, total .....	3 lbs. 6 oz. (1.53 kg)

## Sensor Inputs

RF Filtering .....	RC low-pass filter on each signal line
--------------------	--

## Data Displayed On Console

All data display categories are displayed in alphabetical order:

### Barometric Pressure (sensor located inside console)

Resolution and Units .....	Measured in 0.01" Hg. Other units are converted from Hg and rounded to nearest 0.1 mm, 0.1 hPa, 0.1mb.
Range .....	26.00" to 32.00", 660.0 to 810.0 mm, 880.0 to 1080.0 hPa
Accuracy .....	±0.05", ±1.3 mm, ±1.7 hPa (at room temperature)
Trend (change in 1 hour) .....	±0.2", ±5.0 mm, ±7.0 hPa
Functions .....	Current Barometric Pressure, Current Barometric Pressure Trend, Stored Barometric Pressure Reading

## General

Update Interval .....	16 seconds
Times and Dates of Maximum and Minimum Values .....	Stored with value

### Inside Temperature (Air) (sensor located inside console)

Resolution and Units .....	1 or 0.1°F or 1 or 0.1°C. Celsius is converted from Fahrenheit
Range .....	32° to 140° F (0° to 60° C)
Accuracy .....	±1°F (±0.5°C)
Functions .....	Current Temperature (high and low alarms), Maximum and Minimum Temperatures

## Relative Humidity

Resolution and Units .....	1%
Range .....	10 to 90% RH
Accuracy .....	±5%
Functions .....	Current Inside Relative Humidity (high and low alarms), Maximum and Minimum Relative Humidity Values

## Perception and Wizard Stations

### Time

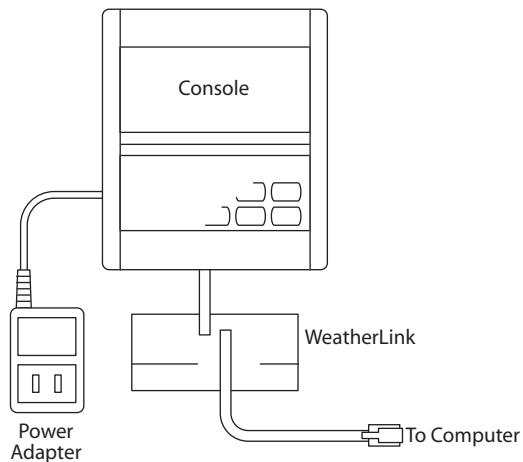
Accuracy ..... ±15 seconds/month  
 Functions ..... Current Time, Current Date

### Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7400	10.00" x 7.50" x 3.25" (254 mm x 190 mm x 83 mm)	1.5 lbs. (0.7 kg)	011698 74000 0
7400EU			011698 74001 7
7400UK			011698 74002 4

### Station Connection Diagram

Perception II Connection Diagram



# Weather Wizard III® Station

7425  
7425CS



## Perception and Wizard Stations

The Weather Wizard III station features the following: anemometer, inside and outside temperature sensors, junction box, and console. The console provides A/D conversion, calculations, and data display. A DC-power adapter and an 8' (2.4m) cable (for connecting the junction box and console) are included. Options include the Rain Collector, and WeatherLink (# 7862) which provides data logging and a serial interface to a computer.

## General

Operating Temperature	-5° to 140° F (-20° to 60° C)
Display Temperature	32° to 140° F (0° to 60° C)
Supply Power (adapter included)	16 mA (typical) at 10 to 16 V (100 mA when display is illuminated)
Connectors	Modular (RJ-11, RJ-12, and RJ-45)
Recommended Maximum Cable Length	240' (72 m), sensor array to console
Housing Material	Black ABS plastic
Display Type	LCD
Dimensions	
Console	5.25" x 5.4" x 3.0" (133 mm x 137 mm x 76 mm)
Display	4.4" x 1.9" (112 mm x 48 mm)
Weight, total	3 lbs. 6 oz. (1.53 kg)

## Sensor Inputs

RF Filtering	RC low-pass filter on each signal line
--------------	--

## Data Displayed on Console

### General

Update Interval	16 seconds
Times and Dates of Maximum and Minimum Values	Stored with value

### Rainfall (requires Rain Collector)

Resolution and Units	0.01" or 0.2 mm (user-selectable)
Daily Rainfall Range	0 to 40.95" (0 to 819 mm)
Total Rainfall Range	0 to 99.99" (0 to 9999 mm)
Rainfall Accuracy	±(4% + 1 count) for rates from 0.01" to 2" (.2 mm to 50 mm) per hour ±(5% + 1 count) for rates from 2" to 4" (50 mm to 100 mm) per hour
Functions (Period is selected by user)	Total Rainfall for period, Daily Rainfall Amount (alarm)

### Temperature

#### Outside Temperature (Air)

Resolution and Units	1 or 0.1°F or 1 or 0.1°C. Celsius is converted from Fahrenheit
Range	-50° to 140° F (-45° to 60° C)
Accuracy	±1°F (±0.5°C)
Functions	Current Temperature (high and low alarms), Maximum and Minimum Temperatures

#### Inside Temperature (Air) (sensor located inside console)

Resolution and Units	1°F or 1°C. (nominal). Celsius is converted from Fahrenheit and rounded to the nearest 1°C.
Range	32° to 140° F (0° to 60° C)
Accuracy	±1°F (±0.5°C)
Functions	Current Temperature (high and low alarms), Maximum and Minimum Temperatures

## Perception and Wizard Stations

### Wind

#### Wind Chill

Resolution and Units ..... 1°F or 1°C.°(nominal). Celsius is converted from Fahrenheit and rounded to the nearest 1°C.  
 Range ..... -134° to 98° F (-92° to 37° C)  
 Accuracy ..... ±4°F (±2°C)  
 Functions ..... Current Wind Chill (alarm), Minimum Wind Chill

#### Wind Direction

Display Resolution ..... 16 points (22.5°) on compass rose, 1° in digital display  
 Accuracy ..... ±7°

#### Wind Speed

Resolution and Units ..... 1 mph, 1 km/hr, 0.1 m/s, or 1 knot (user-selectable)  
 Range (large wind cups) ..... 2 to 150 mph, 2 to 130 knots, 1 to 67 m/s, 3 to 241 km/h  
 Range (small wind cups) ..... 3 to 175 mph, 3 to 150 knots, 1.5 to 79 m/s, 5 to 282 km/h  
 Update Interval ..... 2.25 seconds  
 Accuracy (large wind cups) ..... ±2 mph (2 kts, 3 km/h, 1 m/s) or ±5%, whichever is greater  
 Accuracy (small wind cups) ..... ±3 mph (3 kts, 5 km/h, 1.5 m/s) or ±5%, whichever is greater  
 Functions ..... Current Speed (alarm), Maximum Speed

### Time

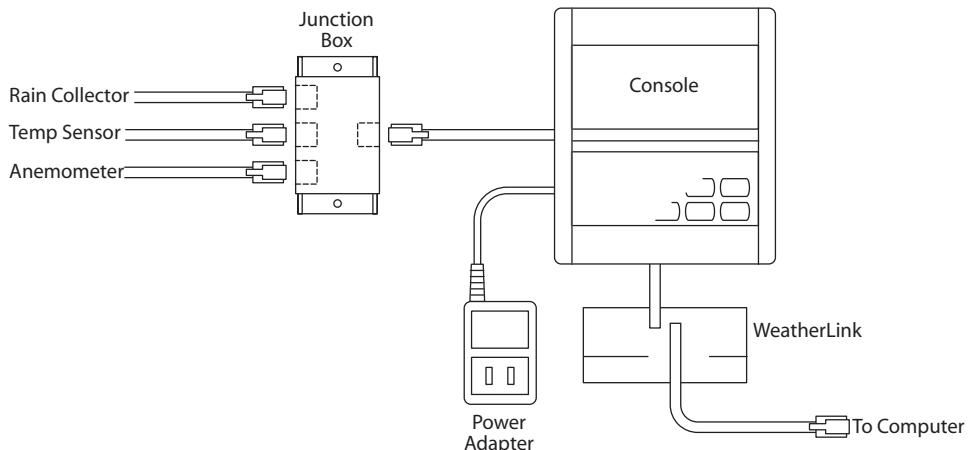
Accuracy ..... ±15 seconds/month  
 Functions ..... Current Time, Current Date

## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7425			011698 74250 9
7425EU	18.00" x 10.25" x 3.25" (458 mm x 261 mm x 79 mm)	4.3 lbs. (2.0 kg)	011698 74251 6
7425UK			011698 74252 3
7425CS			011698 00094 4
7425CSEU	17.50" x 11.75" x 9.25" (458 mm x 299 mm x 235 mm)	8.0 lbs. (3.7 kg)	011698 00094 4
7425CSUK			011698 00094 4

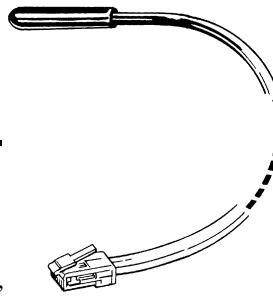
## Station Connection Diagram

Weather Wizard III Connection Diagram



# External Temperature Sensor

7817



Perception and Wizard Sensors

The External Temperature Sensor is used to measure temperatures in general conditions. It is well-suited for air, water, or soil temperature measurements, and it may be used anywhere a reliable, low-cost temperature sensor is required. The sensor is epoxy-encapsulated in a vinyl cap. The External Temperature Sensor uses a precision platinum wire thermistor as a sensor. The thermistor produces a resistance change proportional to temperature.

To ensure accurate readings when measuring outdoor air temperature, the External Temperature Sensor should be shielded from direct sunlight and other sources of reflected or radiated heat. We recommend the use of a Davis Radiation Shield (# 7714) or its equivalent for this purpose.

## General

Sensor Type ..... Platinum wire thermistor

Time Constant

In Still Air ..... 240 seconds

In Liquid ..... 20 seconds

Attached Cable Length ..... 25' (7.6 m)

Note: There is no absolute maximum cable length. Increasing the cable length above 300' (90 m) causes an increased measurement error at a rate of approximately  $+0.06^{\circ}\text{F}$  ( $+0.03^{\circ}\text{C}$ ) per 100' (30 m) at  $136^{\circ}\text{F}$  ( $60^{\circ}\text{C}$ ) and  $+0.012^{\circ}\text{F}$  ( $+0.006^{\circ}\text{C}$ ) per 100' (30 m) at  $77^{\circ}\text{F}$  ( $25^{\circ}\text{C}$ ).

Cable Type ..... 4-conductor, 26 AWG

Connector ..... Modular connector (RJ-11)

Recommended Maximum Cable Length (see Note 1 below) 300' (90 m) from Sensor to SIM

Housing Material ..... Black Vinyl

Housing Dimensions ..... 0.25" diameter x 1.25" long (6.5 mm diameter x 32 mm long)

Weight ..... 4.5 oz. (128 g)

## Console Data

Note: (These specifications apply to sensor output as converted by Davis Instruments weather station consoles.)

Range .....  $-50^{\circ}$  to  $140^{\circ}\text{F}$  ( $-45^{\circ}$  to  $60^{\circ}\text{C}$ )

Accuracy (see Note 2) .....  $\pm 1^{\circ}\text{F}$  ( $\pm 0.5^{\circ}\text{C}$ ) (typical)

Resolution ..... 1.0° or  $0.1^{\circ}\text{F}$  or 1.0° or  $0.1^{\circ}\text{C}$  Celsius is converted from Fahrenheit and rounded to the nearest 0.1° or 1°C

Sample and Display Update Interval ..... 16 seconds (max)

## WeatherLink® Data

Note: (These specifications apply to sensor output as logged and displayed by the WeatherLink.)

Temperature ..... Average over archive interval

High and Low Temperature ..... Maximum and minimum values during archive interval

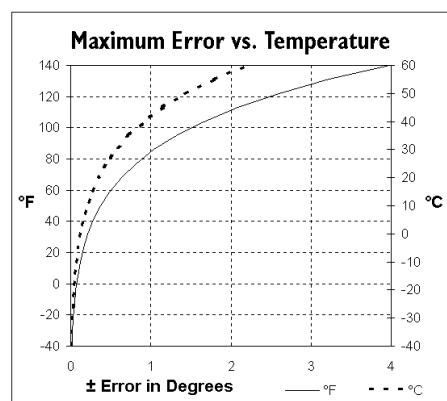
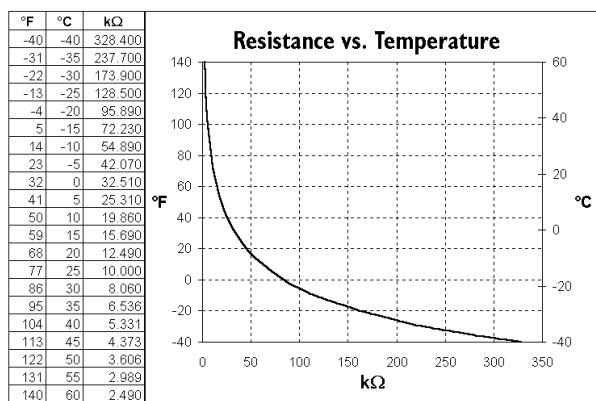
## Input/Output Connections

Black & Red ..... Common

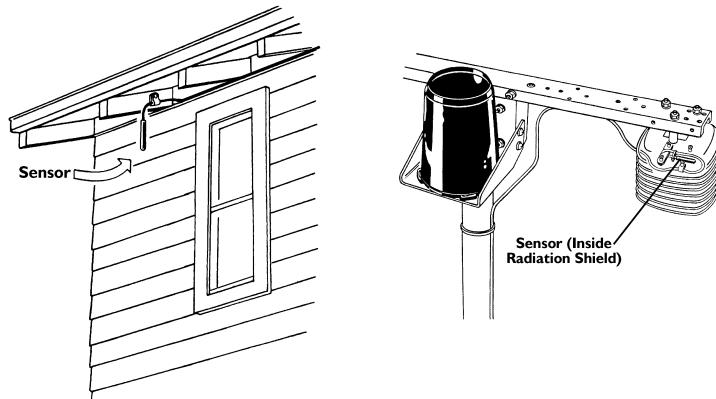
Green & Yellow ..... Temperature (variable resistance to common); 10KOhm, nominal

## Perception and Wizard Sensors

Note: The chart and graph on the left show the resistance of the sensor. The graph on the right shows the maximum error of an uncalibrated sensor.



## Installation Options (Air Temperature)



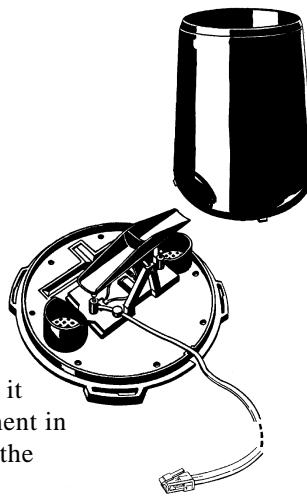
## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7817	2.75" x 2.75" x 1.50" (70 mm x 70 mm x 39 mm)	5.0 oz. (0.15 kg)	011698 78170 6

# Rain Collector

0.01" or 0.2 mm Increments

7852



Perception and Wizard Sensors

The Rain Collector is designed to meet the guidelines of the World Meteorological Organization. Rain enters the collector cone, passes through a debris-filtering screen, and collects in one chamber of the tipping bucket. The bucket tips when it has collected an amount of water equal to the increment in which the collector measures (0.01" or 0.2 mm). As the bucket tips, it causes a switch closure and brings the second tipping bucket chamber into position. The rain water drains out through the screened drains in the base of the collector.

The collector is designed for years of accurate, trouble-free service. The body and base of the collector are constructed of tough, UV resistant plastic; the tipping bucket pivots on bearings that minimize friction and wear. Stainless steel adjustment screws under each chamber of the tipping bucket allow you to fine-tune the calibration of the Rain Collector.

The rain collector comes with an optional metric adapter for converting the rain collector to take 0.2 mm rain measurements for every tip of the bucket. The rain collector comes with mounting holes pre-drilled in the base and a built-in leveling trough to aid you in installing the rain collector. The Rain Collector Heater is available for use with either of the Rain Collector units. This heater allows the Rain Collector to measure the moisture content of snowfall and protects the internal components from freezing rain. If mounted according to instructions, the Rain Collector is wind tunnel tested to be stable in winds up to 140 MPH (224 kph).

## General

Sensor Type	Tipping bucket with magnetic reed switch
Output	Contact closure
Attached Cable Length	40' (12 m)
Cable Type	4-conductor, 26 AWG
Connector	Modular connector (RJ-11)
Recommended Maximum Cable Length	900' (270 m)
Housing Material	UV-stabilized ABS plastic
Dimensions	
Rain Collector	8.75" diameter x 9.5" high (16.5 cm diameter x 24 cm high)
Collection Area	33.2 in <sup>2</sup> (214 cm <sup>2</sup> )
Weight	2 lbs. 3 oz. (1 kg)

## Console Data

Note: (These specifications apply to sensor output as converted by Davis Instruments weather station consoles.)

### Weather Monitor/Wizard Range

Daily Rainfall	0.00" to 99.99" (0.0 mm to 999.8 mm)
Total Rainfall	0.00" to 99.99" (0.0 mm to 9999 mm)
Accuracy	
Rainfall	±4%, ±1 rainfall count between 0.01" and 2.00" per hour (0.2 mm and 50.0 mm per hour); ±5%, ±1 rainfall count between 2.00" and 4.00" per hour (50.0 mm and 100.0 mm per hour)
Resolution	0.01" (0.2 mm)
Sample and Display Update Interval	16 seconds (max)

## Perception and Wizard Sensors

## WeatherLink® Data

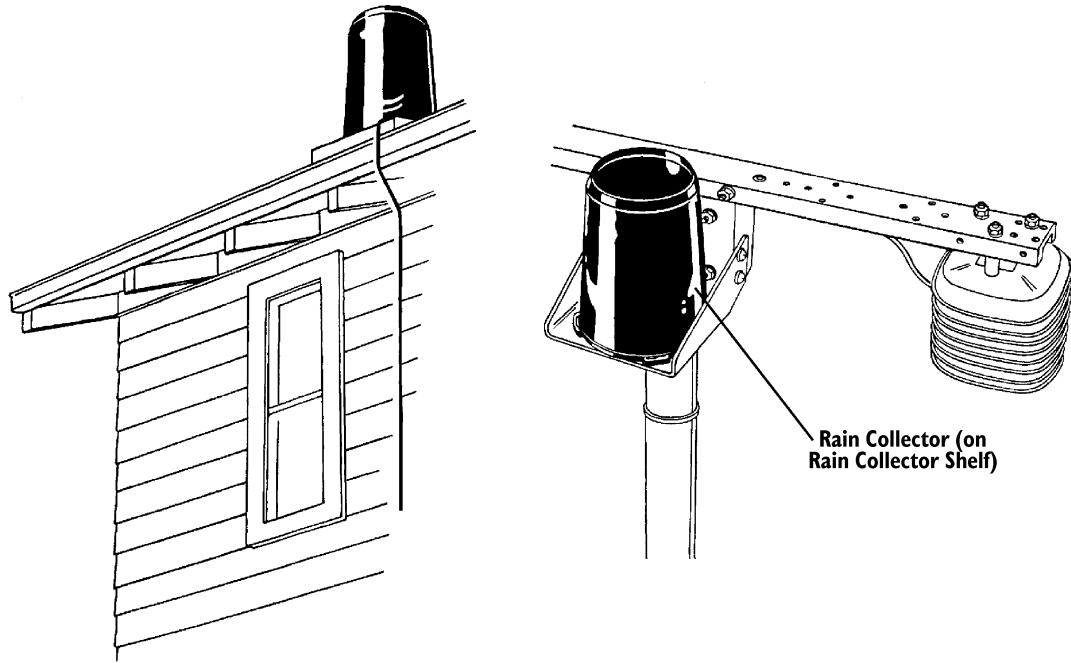
Note: (These specifications apply to sensor output as logged and displayed by the WeatherLink.)

Daily Rainfall ..... Total during archive interval  
 Total Rainfall ..... Total during archive interval  
 Rate of Rainfall ..... Maximum value during archive interval (For Vantage Pro and Pro2 models only)

Note: Input/Output Connections

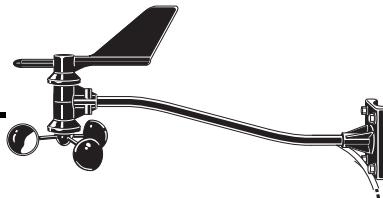
Black & Red ..... Switch terminal  
 Green & Yellow ..... Switch terminal

## Installation Options



## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7852	8.63" x 8.75" x 11.00" (219 mm x 223 mm x 280 mm)	3.3 lbs. (1.5 kg)	011698 78520 9



The Anemometer includes both wind speed and wind direction sensors. Rugged components stand up to hurricane-force winds, yet are sensitive to a light breeze. Includes sealed stainless-steel bearings for long life. The range and accuracy specifications of this unit have been verified in wind-tunnel tests (information available upon request). A model 7911 Anemometer reported wind speeds of 175 miles per hour before its tower collapsed during hurricane Andrew, 1992. Digital filtering, with time constant as specified below, is applied to wind direction measurements. In areas where icing of the anemometer is a problem, use Anemometer Drip Rings to deflect water from the joint between moving parts.

## General

### Sensor Type

Wind Speed	Wind cups and magnetic switch
Wind Direction	Wind vane and potentiometer
Attached Cable Length	40' (12 m)

Note: On Monitor and Wizard stations, cable lengths longer than 140' (42 m) between sensors and console may artificially limit wind speed readings. That is, beyond that length, maximum recordable wind speed decreases as cable length increases. For example, with a length of 140' (42 m), the maximum recordable speed exceeds 175 mph. At 240' (72 m), however, the maximum recordable speed drops to less than 140 mph. Below that upper limit, however, the anemometer's accuracy is not affected.

Cable Type	4-conductor, 26 AWG
Connector	Modular connector (RJ-11)

### Recommended Maximum Cable Length

Wizard and Monitor ..... 140' (42 m) Sensor to Console

### Material

Wind Vane and Control Head	UV-resistant ABS
Wind Cups	Polycarbonate
Anemometer Arm	Black-anodized aluminum

Dimensions ..... 18.5" long x 7.5" high x 4.75" wide (470 mm x 191 mm x 121 mm)

Weight ..... 2 lbs. 15 oz. (1.332 kg)

## Console Data

Note: These specifications apply to sensor output as converted by Davis Instruments weather station consoles.

### Range

Wind Speed (large wind cups) (See Note 1)	2 to 150 mph, 2 to 130 knots, 1 to 67 m/s, 3 to 241 km/h
Wind Speed (small wind cups) (See Note 1)	3 to 175 mph, 3 to 150 knots, 1.5 to 79 m/s, 5 to 282 km/h
Wind Direction	0° to 360° or 16 compass points
Wind Run	0 to 1999.9 miles (1999.9 km)

### Accuracy

Wind Speed (large wind cups)	±2 mph (2 kts, 3 km/h, 1 m/s) or ±5%, whichever is greater
Wind Speed (small wind cups)	±3 mph (3 kts, 5 km/h, 1.5 m/s) or ±5%, whichever is greater
Wind Direction	±7°
Wind Run	±5%

### Resolution

Wind Speed	1 mph (1 knot, 0.1 m/s, 1 km/hr)
Wind Direction	1° (0° to 355°), 22.5° between compass points
Wind Run	0.1 m (0.1 km)

## Perception and Wizard Sensors

### Measurement Timing

Wind Speed Sample Period	2.25 seconds
Wind Speed Sample and Display Interval	2.25 seconds (Monitor & Wizard)
Wind Direction Sample Interval	1 second (Monitor & Wizard)
Wind Direction Filter Time Constant (typical)	8 seconds (Monitor & Wizard)
Wind Direction Display Update Interval	2 seconds (Monitor & Wizard)

## WeatherLink® Data

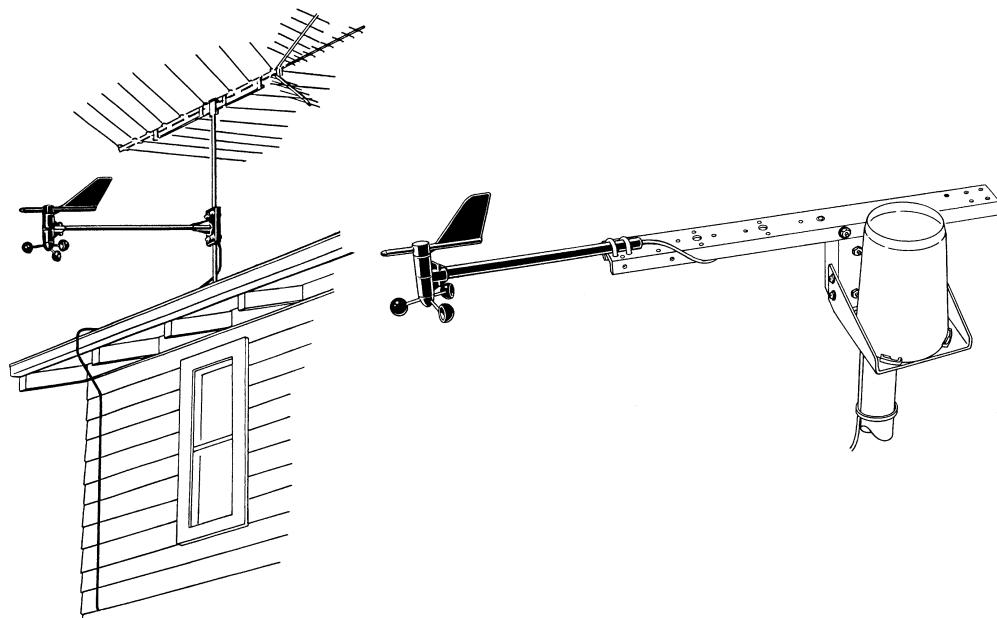
Note: These specifications apply to sensor output as logged and displayed by the WeatherLink.

Wind Speed	Average during archive interval
High Wind Speed	Maximum during archive interval
Wind Direction	Dominant wind direction during archive interval

## Input/Output Connections

Black	Wind speed contact closure to ground
Green	Wind direction pot wiper (360° = 20 kOhm)
Yellow	Pot supply voltage
Red	Ground

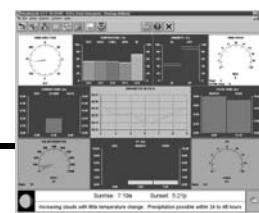
## Installation Options



## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7911	17.50" x 5.75" x 2.50" (445 mm x 146 mm x 64 mm)	1.7 lbs. (.7 kg)	011698 79110 1

# WeatherLink® for Vantage Pro® and Vantage Pro2™



<b>6510SER</b>	<b>6544</b>
<b>6510USB</b>	<b>6550</b>
<b>6540</b>	<b>6560</b>

WeatherLink

## Software and Data Logger

WeatherLink® for Vantage Pro® and Vantage Pro2™ consists of our WeatherLink software and a specialized data logger that connects to a Vantage Pro or Vantage Pro2 console. The software and data logger transfer your Vantage Pro or Vantage Pro2 weather data to your computer, allowing you to create a permanent weather database. Once stored in the database, your weather information can be used to generate a wide variety of reports and graphical displays, and can also be shared via the Internet. WeatherLink is packaged with one of the following data loggers:

- **Serial Data Logger (# 6510SER)** — Connects your Vantage Pro or Vantage Pro2 console to a computer via a serial connection or a remote modem connection.
- **USB Data Logger (# 6510USB)** — Connects your Vantage Pro or Vantage Pro2 console to a computer via a USB connection.

WeatherLink is also available in specially designed models:

- **WeatherLink for APRS with Streaming Data Logger (# 6540)** — Connects a Vantage Pro2 console or Weather Envoy to a ham radio with TNC modem for instant transmission of both your location and the local weather conditions via APRS.
- **WeatherLink with Alarm Output with Connector Block (# 6544)** — Allows you to use the weather station to control fans, heaters, etc., based on weather parameters you set.
- **WeatherLink for Emergency Response Teams (# 6550)** — Provides real-time weather data needed to map the footprint of a hazardous plume, predict its dispersion, and help make critical public safety decisions.
- **WeatherLink for Irrigation Control with Connector Block (# 6560)** — Allows you to use your weather station to turn your irrigation system on or off.

Each also simultaneously logs and stores the data, which can later be downloaded to your PC for all the graphing, charting, and analysis available in WeatherLink.

## WeatherLink Software Features

- Displays the current weather station data in a real-time “bulletin” on the computer.
- Allows you to set and clear data in the weather station console (time and date, highs and lows, alarm thresholds, calibration numbers, etc.) from the computer.
- Graphs archived weather data on an hourly, daily, weekly, monthly, or yearly basis.
- Generates Weather Watcher reports in the National Climatic Data Center (NOAA) format.
- Collects data from multiple weather stations on the same computer.
- Compatible with Weather Monitor II, Weather Wizard III, and Perception II weather stations.
- Internet support for creating your own weather website and for uploading other files such as web cam images.
- Includes support for GLOBE, an international weather-related science program for students from elementary through high school. Visit [www.globe.gov](http://www.globe.gov) for more information.
- APRS data protocol allows volunteers in the Citizen Weather Observer Program (CWOP) to send real-time weather data to the National Weather Service. CWOP data is used for weather education and research projects. Visit [www.wxqa.com](http://www.wxqa.com) for more information.

## WeatherLink Data Logger Features

- Archives weather data for subsequent transfer to the computer.
- Manages data communication between the weather station and the WeatherLink software.
- Information on WeatherLink communications protocols and data formatting can be found on the Software Support page at our website: (<http://www.davisnet.com/support/weather/>).

## Software System Requirements (6510SER, 6540, 6544, 6550, or 6560)

Computer running Windows™ 95, 98, ME, NT 4.0, Windows 2000 or XP with at least one free serial port and 5 MB of free disk space. The amount of disk space necessary for the data files depends on the archive interval. Each archive record in the database is 88 bytes. Every day in the database has an additional two records totalling 176 bytes that

## WeatherLink

store daily summary information. A database containing data stored at a 30-minute archive interval requires approximately 4400 bytes of disk space per day or 132 KB of disk space per month. The file size changes in a linear fashion depending on the archive interval. For example, data stored at a one-minute interval requires approximately 3.9 MB a month while the data stored at a two-hour interval requires approximately 33 KB a month.

For phone modem connections, the following additional hardware is required: One external modem to connect to the WeatherLink and one internal modem or external modem connected to your computer (modems must be Hayes compatible), and Telephone Modem Adapter (# 6533).

## Software System Requirements (for 6510USB)

Computer running Windows™ 98 SE, ME, Windows 2000 or XP with at least one free USB port and 5 MB free disk space. The amount of disk space necessary for the data files depends on the archive interval. Each archive record in the database is 88 bytes. Every day in the database has an additional two records totalling 176 bytes that store daily summary information. A database containing data stored at a 30-minute archive interval requires approximately 4400 bytes of disk space per day or 132 KB of disk space per month. The file size changes in a linear fashion depending on the archive interval. For example, data stored at a one-minute interval requires approximately 3.9 MB a month while the data stored at a two-hour interval requires approximately 33 KB a month.

### Communication Protocol

Data Channel Characteristics ..... 1200, 2400, 4800, 9600, 14,400 and 19,200 baud (software-selectable), RS-232, half-duplex, data only (no CTS or RTS)

### Data Logger Functions

Control Functions .....	Set archive interval, set/clear calibration numbers, set Longitude/Latitude, set Year-to-Date rain total, set/clear alarm thresholds, clear total values, set time/date.
Download .....	Data may be transferred automatically to your computer once an hour using the Auto Download command. More frequent downloads can be selected to support Internet file transfers. Only new archive data is transferred during the download.

### Data Logger Archived Data

The Data Logger stores up to 2560 archive records (one 52-byte record per archive interval) for later transfer to your computer. The archive records are stored in 128K of non-volatile memory; protecting the data even if the console loses power. Maxima, minima, averages, and totals are taken over the archive interval.

Archive Record Data .....	Time/Date of Record, Inside Temperature (last or avg.), Outside Temperature (last or avg.), Maximum Air Temperature, Minimum Air Temperature, Wind Direction (dominant), Wind Speed (average), Maximum Wind Speed, Rainfall (total), Rain Rate, Inside Humidity (last), Outside Humidity (last), Barometric Pressure (last), Solar Radiation, Hi Solar Radiation, UV, Hi UV, Evapotranspiration, Forecast, Leaf Temperature (2), Leaf Wetness (2), Extra Humidity (2), Extra Temperature (2), Soil Temperature (4), Soil Moisture (4), Wind Samples, Wind Tx, Length of Archive Interval, ISS Reception
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Archive Interval .....	User-selectable from the following intervals (in minutes): 1, 5, 10, 15, 30, 60, or 120
------------------------	---

Archive Storage Capacity (the amount of time before the archive is completely filled):

1 Minute Archive Interval .....	42 hours
5 Minute Archive Interval .....	8 days
10 Minute Archive Interval .....	17 days
15 Minute Archive Interval .....	26 days
30 Minute Archive Interval .....	53 days
60 Minute Archive Interval .....	106 days
120 Minute Archive Interval .....	213 days

Download .....	Data may be transferred automatically from the data logger to your computer up to once an hour using the Auto Download command. Data can be transferred more frequently, from once a minute to once every two hours, to support Internet uploading and other data sharing features. Only new archive data is transferred during the download.
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## Data Display Options

Some of the weather data and reports listed below require optional sensors.

### Real-Time Displays (these displays update in real-time):

Graphical Bulletin . . . . . Inside Temperature, Outside Temperature, Wind Direction (0°- 360°), Wind Speed, Daily Rain Total, Monthly Rain Total, Year-to-Date Rain Total, Storm Total, Rain Rate, Inside Humidity, Outside Humidity, Barometer, Barometer 6-hour Plot, Evapotranspiration (ET) (day, month, year), Today's Highs and Lows, Forecast Icons, Forecast Text, and Illuminated Fraction of the Moon Disk.

Text-Based Summary . . . . . Inside Temperature, Outside Temperature, Wind Direction (0°- 360°), Wind Speed, Daily Rain Total, Monthly Rain Total, Year-to-Date Rain Total, Storm Total, Rain Rate, Inside Humidity, Outside Humidity, Barometer, UV, Solar Radiation, ET (day, month, year), Today's Highs and Lows, Forecast Text, and Moon Phase.

Update Interval . . . . . Two seconds (approximately)

### Plotting Displays:

Plot Window . . . . . Enables graphing of all database information (multiple variables may be plotted on a single graph) over any of the following spans (1 hr, 4 hr, 8 hr, 12 hr, 1 day, 3 days, Week, Month, Year). Multiple dates may also be plotted on the same graph.

Strip Charts . . . . . Four stacked line graphs (multiple variables may be plotted on a single graph), which update at the time of each archive interval. Strip charts may use any of the following spans (1 hr, 4 hr, 8 hr, 12 hr, 1 day, 3 days, Week, Month, Year).

### Reports:

NOAA Monthly Summary . . . . . Based on the National Oceanic and Atmospheric Administration (NOAA) Monthly Weather Watcher report

NOAA Yearly Summary . . . . . Based on the National Oceanic and Atmospheric Administration (NOAA) Yearly Weather Watcher report

Yearly Rainfall . . . . . Calculates rainfall totals broken down by month and year. Rainfall data may be altered and data may be added to reflect rainfall totals for months and years which are not contained in your weather database.

Degree-Days . . . . . Tracks degree-days and progress towards development for an unlimited number of crops or pests; base and upper development thresholds and development totals entered by user.

Temperature/Humidity Hours . . . . . Calculates the number of hours the temperature has been either above or below a given threshold, and that during which time the humidity was above a given threshold from a given start date. Typically used to track conditions for the development of agricultural pests and molds.

Soil Temperature Hours . . . . . Calculates the time that soil temperature has been above freezing (or some other threshold). Typically used to determine a time to plant crops.

Chilling Requirements . . . . . Calculates the number of hours spent below a specified temperature during a specified period of time. Typically used to determine if the coldness requirement for a fruit tree in dormancy has been met.

Bright Sunshine Hours . . . . . Calculates amount of sunshine for a selected time period.

Leaf Wetness Hours . . . . . Calculates the amount of leaf wetness hours over a selected time period.

Fuel Demand . . . . . Estimates fuel usage based on past usage and outside temperatures.

Total ET . . . . . Calculates ET for a selected time period.

Sunrise & Sunset Times . . . . . Calculates sunrise and sunset times for any given latitude, longitude and date.

## WeatherLink for APRS with Streaming Data Logger (6540)

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The Streaming Data Logger is designed for ham radio operators with the capability of accepting APRS data packets. The product will allow the user to transmit weather data over ham radio without the need for a PC. Some configurations may require a TNC modem. TNC (Terminal Node Controller) modems translate the data from a Vantage Pro or Vantage Pro2 into packets for transmission via ham radio.

### Hardware Installation and Requirements

In addition to the WeatherLink requirements, the streaming data capability has the following additional hardware requirements.

- Ham radio with attached TNC modem capable of accepting APRS data packets.
- Computer running any version of Windows™ with at least 3 MB of RAM and 512 KB of hard disk space.

For further and more detailed information on APRS, please visit the following website:

<http://web.usna.navy.mil/~bruninga/aprs.html>.

### Streaming Function Specifications

Time Out Period:	.....	The streaming data logger utilizes a time-out period for ceasing streaming whenever software attempts to communicate to the logger. Once communications to WeatherLink are initiated and successful, the streaming data logger will be unable to communicate with the Streaming Data Utility until the Time Out Period expires.
Range	.....	5 to 255 seconds (user selectable)
Default Value	.....	5
Streaming Interval:		
Range	.....	1 to 99 minutes (user selectable)
Default Value	.....	5 minutes
Streaming Baud Rate	.....	Available Rates: 1200, 2400, 4800, 9600, 19200 (WeatherLink 5.6 or later)
Default:	.....	9600
Streaming Data Output Parameters:	.....	Day of the Month, Time in GMT & 24 hour format, Latitude & Longitude, Wind direction (in degrees), Wind Speed (1 min. avg. in mph), High Wind Speed (in mph in the last 5 min.), Temperature (°F), Rainfall (inches) in the last hour, Rainfall (inches) in the last 24 hours, Daily Rainfall (inches since midnight), Humidity (in %, omitted if missing), Barometric pressure (mb/hPa, omitted if missing), Solar Radiation (in W/m <sup>2</sup> , omitted if missing).

## WeatherLink for Alarm Output with Connector Block (6544)

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The Connector Block is designed to allow you to turn heaters, fans, and other devices on or off using the data from your weather station. The utility software steps you through the choices. For each of four outputs, you can enter up to eight different weather parameters. Enter threshold values for each, select from nine different test conditions, and logically combine the entries together as you choose. Our connector block provides the interface between your Vantage Pro2 console or Weather Envoy and an electrical device. For high-power devices, you may also need to add electrical relays (not supplied by Davis Instruments).

### Hardware Installation and Requirements

In addition to the requirements for WeatherLink, the Irrigation capability has the following additional hardware requirements.

- Computer running any version of Windows™ with at least 3 MB of RAM and 512 KB of hard disk space.
- Relays: You may need to obtain your own relays in order to switch equipment at voltages higher than 28 volts or power levels above 10 Watts.

**Caution:** The Alarm Output data logger is not suitable for any use in which the health or safety of any person or the value or protection of valuable property is dependent on the operation of the device.

## Function Specification

Operating Temperature .....	-40° to +140°F (-40° to +60°C)
Output Contact Closures .....	4 Alarm Contact Specifications, Terminal Block with stainless steel cage clamp screw terminals.
Each of the four output contacts is rated as follows:	
Type .....	Photo-coupled MOS FET
Load Voltage .....	28VAC or 48VDC
Peak Voltage .....	± 60 V, maximum
Load Current .....	± 1.8 A, continuous maximum at 77°F (25°C), derated to 0.7 A at 185°F, (85°C)
Peak Load Current .....	6 A for 100 msec., maximum
ON Resistance .....	0.12 Ohms, maximum
OFF Leakage .....	1 uA, maximum
Power Dissipation .....	550 mW, maximum
Output Contact Closure Functions (Set through the configuration software utility):	
Station Configuration .....	Allows user to configure available test parameter list based on station model and accessories.
Units .....	Allows user to enter test parameters in English or metric.
Available Test Parameters .....	Outside Temperature, Outside Humidity, Outside Dewpoint, Current Wind Speed, 10 min Avg. Wind speed, Wind Direction, Wind Chill, Outside Heat Index, Barometer Value, Barometer Trend: (Rising Rapidly, Rising Slowly, Steady, Falling Slowly, Falling Rapidly), Daily Rain, Storm Total Rain, Monthly Rain, Yearly Rain, Rain Rate, Solar Radiation, UV Radiation, Inside Temperature, Inside Humidity, Inside Dewpoint, Inside Heat Index, Extra Temperature (1- 8: # based on Tx ID), Extra Humidity (1- 8: # based on Tx ID) Daily ET, Monthly ET, Yearly ET, Leaf Wetness (1-2), Soil Moisture (1-4), Leaf Temperature (1-2), Soil Temperature (1-4), Time, Transmitter Battery Status (ID# 1-8), Repeater Battery Status (ID# A-H), Console Batteries, ISS Reception (% since midnight)
Test Conditions .....	Greater Than or =, Less Than or =, Between, Not Between, True (or False, used for Barometer Trend and Battery Status Parameters), Trending, Equal, Minus (Difference), Missing (if data is dashed)
Logical Grouping Options .....	Alarm Triggers on any user-selected logical grouping of up to 8 test conditions (up to 7 if using the Minus or Difference Test Condition/ Check Type): OR (any test conditions can be true), AND (all test conditions must be true), XOR (only one test condition can be true), DONE (only on test condition used)
Alarm Logging .....	The log will consist of which output became active, which parameters caused the alarm to become active (useful for the AND type alarm) along with the date and time that the alarm became active. This log is cleared whenever any of the output alarms are cleared. Can be activated or deactivated by the user.
Output Contact Closure Functions	
Duration .....	0 to 255 minutes (user selectable). Determines how long the alarm output should stay active once it is triggered. Default = 10 minutes
Reactivation .....	0 to 255 minutes (user selectable). Determines how long to leave the alarm output deactivated once it is deactivated. Default = 0.
Pulse Width .....	0 to 9999 milliseconds (user selectable). Default = 2000 milliseconds (2 seconds).
Activation .....	Continuous or Pulse (1-time) (user selectable). Determines whether a pulse for alarm activation is continuous throughout the activation time or a one time pulse. Pulsed relay oriented devices will require the one-time pulse. Default = Continuous
Circuit Behavior .....	Normally Open or Normally Closed (user-selectable). Determines whether the circuit stays open or closed when no alarms are active. The opposite behavior occurs for an active alarm condition. Normally closed is the most typical operation for Irrigation controller use. Default = Normally Closed.
Test Mode Function .....	Available. Continuous, Open, or Closed circuit (user-selectable).

## WeatherLink for Emergency Response Teams with Streaming Data Logger (6550)

The Streaming Data Logger is designed for use with the free CAMEO® software developed by National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA). It provides the real-time weather data needed to map the "footprint" of a hazardous plume, predict its dispersion, and help make critical public safety decisions. Please note that this product is specifically designed to work with the ALOHA® software program and will not work with other such programs of this type. For further and more detailed information on this product, please visit the following website: <http://www.epa.gov/ceppo/cameo/aloha.htm>.

Note: CAMEO, or Computer-Aided Management of Emergency Operations, is a suite of three integrated software applications, including ALOHA® Areal Locations of Hazardous Atmospheres.

### Hardware Installation and Requirements

In addition to the WeatherLink requirements, the streaming data capability has the following additional hardware requirements:

- Computer running any version of Windows™ with at least 1 MB of RAM and 2.5 MB of hard disk space

### Streaming Function Specifications

Time Out Period: ..... The streaming data logger utilizes a time-out period for ceasing streaming whenever software attempts to communicate to the logger. Once communications to WeatherLink are initiated and successful, the streaming data logger will be unable to communicate with the Streaming Data Utility until the Time Out Period expires.

Range ..... 5 to 255 seconds (user selectable)

Default Value ..... 5

Station ID # ..... ALOHA® uses a station ID number in the streaming data transmission. Although a station ID number is included in each data transmission, ALOHA® does not use this value.

Range ..... 0 to 999 (user selectable)

Default Value ..... 1

Streaming Interval ..... 30 seconds (fixed, as required by ALOHA® software)

Streaming Baud Rate ..... 1200 (fixed, as required by ALOHA® software)

Streaming Data Output Parameters: ..... Station ID #, the vector mean wind speed, (5 minutes average in m/sec), mean wind direction (5 minutes average in degrees true), standard deviation of the wind direction ("sigma-theta") (degrees), mean air temperature, (5 minutes average in °C), instantaneous wind speed (m/sec), instantaneous wind direction (in degrees true), instantaneous air temperature (°C), instantaneous console or Envoy battery voltage as required by ALOHA®.

## WeatherLink for Irrigation Control with Connector Block (6560)

The connector block is designed for use with most common irrigation systems, including Rain Bird, Rain Master, and Toro. For the industrial controllers used in agriculture and turf management, it provides electronic pulses for wind, rain, and evapotranspiration (ET). Homeowners can add our optional Solar Radiation Sensor to turn the system on or off based on evapotranspiration. All users can use the alarm settings in the Vantage Pro or Pro2 console or Weather Envoy to inhibit the irrigation cycle based on weather conditions. The device will inhibit the irrigation cycle if ANY of the alarms are active.

### Hardware Installation and Requirements

In addition to the requirements for WeatherLink, the Irrigation capability has the following additional hardware requirements.

- Computer running any version of Windows™ with at least 3 MB of RAM and 512 KB of hard disk space.
- Industrial Irrigation Controller with inputs for wind, rain, and/or ET; or a Residential Controller with a Common or a Rain Sensor connection. Irrigation wire as appropriate to your Irrigation Controller
- Solar Radiation Sensor, P/N 6450 to use evapotranspiration (ET) to control the irrigation cycle. In addition to the

ET pulse output, the Rain - ET algorithm uses this information. More information is provided below.

- Relays: You may need to obtain your own relays in order to switch equipment at voltages higher than 28 volts or power levels above 10 Watts.

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Note: An industrial controller can also be connected to the Alarm Output on the irrigation data logger if you want the irrigation system to also be suspended due to cold temperatures.

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Note: A residential controller may be connected in series to both the ET and Alarm outputs on the Irrigation data logger if you want the irrigation system to also be suspended due to high winds or cold temperatures in addition to the Rain-ET balance.

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**Caution:** The Alarm Output Module is not suitable for any use in which the health or safety of any person or the value or protection of valuable property is dependent on the operation of the streaming data logger.

## Function Specification

Operating Temperature ..... -40° to 140°F (-40° to 60°C)

Output Contact Closures ..... 4: Wind, Rain, ET & Alarm Contact Specifications, Terminal Block with stainless steel cage clamp screw terminals.

Each of the four output contacts is rated as follows:

Type .....	Photo-coupled MOS FET
Load Voltage .....	28VAC or 48VDC
Peak Voltage .....	± 60 V, maximum
Load Current .....	± 1.8 A, continuous Maximum at 77°F (25°C), derated to 0.7 A at 185°F, (85°C)
Peak Load Current.....	6 A for 100 msec., maximum
ON Resistance.....	0.12 Ohms, maximum
OFF Leakage.....	1 uA, maximum
Power Dissipation .....	550 mW, maximum

Output Contact Closure Functions:

Wind .....	1 pulse per 1 mph in 2 seconds. Frequency in Hz is half the wind speed in mph
Rain .....	1 pulse per tip of the rain bucket. Depends upon rain collector type setting in console (0.01" or 0.2 mm)
ET .....	1 pulse per 0.01" in Industrial mode only; acts as an alarm in Residential mode (see below) only
Alarm .....	Triggers on any active alarm set on the Vantage Pro or Pro2 console/ Envoy. Functions according to settings listed below:
Duration .....	0 to 255 minutes (user selectable). Determines how long the alarm output should stay active once it is triggered. Default = 10 minutes
Reactivation .....	0 to 255 minutes (user selectable). Determines how long to leave the alarm output deactivated once it is deactivated. Default = 0.
Pulse Width.....	0 to 9999 milliseconds (user selectable). Default = 2000 milliseconds (2 seconds).
Activation .....	Continuous or Pulse (1-time) (user selectable). Determines whether a pulse for alarm activation is continuous throughout the activation time or a one time pulse. Pulsed relay oriented devices will require the one-time pulse. Default = Continuous
Behavior .....	Normally Open or Normally Closed (user-selectable). Determines whether the circuit stays open or closed when no alarms are active. The opposite behavior occurs for an active alarm condition. Normally Closed is the most typical operation for Irrigation controller use. Default = Normally Closed.
Test Mode Function .....	Available. Continuous, Open, or Closed circuit (user-selectable).
Residential Mode .....	Used with a Residential Irrigation System Controller to inhibit the watering cycle. This type of sprinkler controller will be what is typically installed by most homeowners and will have inputs for a Common and in many cases a Rain Sensor. The following functions are available for this mode only:

**WeatherLink**

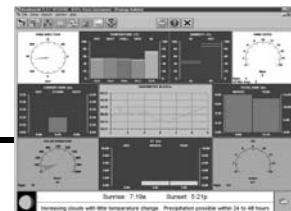
Irrigation Cycle ..... 1 to 255 hours (user-selectable). Indicates the number of hours between entire watering cycles, which are the period of time it takes for all programmed cycles on the Irrigation controller to start, finish and then begin again. Default = 24 (daily watering cycle).

Rain - ET Threshold ..... -9.99" to +9.99", (253.7 mm) (user-selectable) Difference between the Total Rainfall minus the Total Evapotranspiration (ET) over the Irrigation Cycle (see above). Update Interval = 1 hour. Default = 0.

Rain Rate Cut-Off ..... 0.00" to 0.99"/hour (25.1 mm/hour) or off (user-selectable). Used to inhibit the irrigation cycle during heavy rain situations. Default = 0.30"/hour (7.6 mm/hour). This function can be disabled in the streaming data utility bundled with WeatherLink 5.6 or later.

**Package Dimensions**

Product #	Package Dimensions (Width x Height x Depth)	Package Weight	UPC Codes
6510SER	6.00" x 9.00" x 1.75" (152 mm x 229 mm x 45 mm)	8.0 oz. (0.23 kg)	011698 00726 4
6510USB			011698 00727 1
6540		9.6 oz. (0.28 kg)	011698 00736 3
6544		10.3 oz. (0.29 kg)	011698 00820 9
6550		8.6 oz. (0.24 kg)	011698 00737 0
6560		9.9 oz. (0.29 kg)	011698 00738 7



## Software and Data Logger

WeatherLink for Vantage Pro2™, Mac OS X version, consists of our WeatherLink software and a data logger that connects to a Vantage Pro console. Used together, they enable the transfer of data from your Vantage Pro2 console to your computer for creation of a permanent weather database. Once stored in the database, your weather information may be used to generate a wide variety of reports and graphical displays.

## WeatherLink Software Features

- Displays the current weather station data in a real-time “bulletin” on the computer.
- Allows you to set and clear data in the weather station console (time and date, highs and lows, alarm thresholds, calibration numbers, etc.) from the computer.
- Graphs archived weather data on an hourly, daily, weekly, monthly, or yearly basis.
- Generates Weather Watcher reports in the National Climatic Data Center (NOAA) format.
- Collects data from multiple weather stations on the same computer.
- Posts weather conditions to your web site and uploads other files such as web cam images.

## WeatherLink Data Logger Features

- Archives weather data for subsequent transfer to the computer.
- Manages data communication between the Vantage Pro2 weather station and the WeatherLink software.

## Software System Requirements

Apple Macintosh computer running OS-X with 5 MB of free disk space, plus a free USB port. The amount of disk space necessary for the data files depends on the archive interval. Each archive record requires 21 bytes of disk space. Database files containing data stored at a 30-minute archive interval require approximately 36K of disk space per month of data. The file size changes in a linear fashion depending on the archive interval. For example, data stored at a 1-minute interval requires approximately 1.1 MB per month, while the data stored at a 2-hour interval requires approximately 9K per month.

For phone modem connections, the following additional hardware is required: One external modem to connect to the WeatherLink and one internal modem or external modem connected to your computer (modems must be Hayes compatible), and Telephone Modem Adapter (#6533).

## Communication Protocol

Data Channel Characteristics ..... 1200, 2400, 4800, 9600, and 19,200 baud (software-selectable), RS-232, half-duplex, data only (no CTS or RTS)

Data Logger Functions

Control Functions ..... Set Archive Interval, Set/Clear Calibration Numbers, Set Longitude and Latitude, Set Year-to-Date Rain Total, Set/Clear Alarm Thresholds, Clear Total Values, Set Time and Date, Set Tranceiver

Download ..... Data may be transferred automatically from the data logger to your computer at various times during the day selected by the user, from once every minute up to once every two hours. Only new archive data is transferred during the download.

**Data Logger Archived Data**

The data logger stores up to 2560 archive records (one 52-byte record per archive interval) for later transfer to your computer. The archive records are stored in 128K of non-volatile memory; protecting the data even if the console loses power. Maxima, minima, averages, and totals are taken over the archive interval.

Archive Record Data . . . . . Time/Date of Record, Inside Temperature (last), Outside Temperature (last), Maximum Air Temperature, Minimum Air Temperature, Wind Direction (dominant), Wind Speed (average), Maximum Wind Speed, Rainfall (total), Inside Humidity (last), Outside Humidity (last), Barometric Pressure (last), Length of Archive Interval

Archive Interval . . . . . User-selectable from the following intervals (in minutes): 1, 5, 10, 15, 30, 60, or 120

Archive Storage Capacity (the amount of time before the archive is completely filled):

1 Minute Archive Interval . . . . .	42 hours
5 Minute Archive Interval . . . . .	8 days
10 Minute Archive Interval . . . . .	17 days
15 Minute Archive Interval . . . . .	26 days
30 Minute Archive Interval . . . . .	53 days
60 Minute Archive Interval . . . . .	106 days
120 Minute Archive Interval . . . . .	213 days

**Data Display Options**

Real-Time Displays (these displays update in real-time).

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Note: Some of the weather data and reports listed here require optional sensors.

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Graphical Bulletin (charts, plots and dials) . . . . . Inside Temperature, Outside Temperature, Heat Index, Wind Chill, Dew Point, Wind Direction (0°-360°), Wind Speed, Daily Rain Total, Monthly Rain Total, Year-to-Date Rain Total, Storm Total, Rain Rate, Inside Humidity, Outside Humidity, Barometer, Barometer 6-hour Plot, Solar Radiation, UV Index, Forecast Icons, and Illuminated Fraction of the Moon Disk.

Summary Window (text) . . . . . Inside Temperature, Outside Temperature, Heat Index, Wind Chill, Inside Humidity, Outside Humidity, Dew Point, Wind Speed, 10 Minute Avg Wind Speed, Wind Direction (0°-360°), Barometer, Rain Rate, Solar Radiation, UV, Rain (Daily, Storm, Month, Year), Sunrise, Sunset, Moon Phase, Forecast.

Update Interval . . . . . Two seconds (approximately)

**Plotting Displays**

Plot Window . . . . . Enables graphing of all database information (multiple variables may be plotted on a single graph) over any of the following spans (1 hr, 4 hr, 8 hr, 12 hr, 1 day, 3 days, Week, Month, Year). Multiple dates may also be plotted on the same graph.

Strip Charts . . . . . Three stacked line graphs (multiple variables may be plotted on a single graph), which can be updated at the time of each archive interval. Strip charts may use any of the following spans (1 hr, 4 hr, 8 hr, 12 hr, 1 day, 3 days, Week, Month, Year).

**Reports**

Chilling Requirements . . . . . Calculates the number of hours spent below a specified temperature during a specified period of time. Typically used to determine if the coldness requirement for a fruit tree in dormancy has been met.

Degree-Days . . . . . Tracks degree-days and progress towards development for an unlimited number of crops or pests; base and upper development thresholds and development totals entered by user.

NOAA Monthly Summary . . . . . Based on the National Oceanic and Atmospheric Administration (NOAA) Monthly Weather Watcher report.

NOAA Yearly Summary . . . . . Based on the National Oceanic and Atmospheric Administration (NOAA) Yearly Weather Watcher report.

Soil Temperature Hours . . . . . Calculates the time that soil temperature has been above freezing (or some other threshold). Typically used to determine a time to plant crops.

Sunrise & Sunset Times . . . . . Calculates sunrise and sunset times for any given latitude, longitude and date.

Temperature/Humidity Hours . . . . . Calculates the number of hours the temperature has been either above or below a given threshold, and that during which time the

humidity was above a given threshold from a given start date. Typically used to track conditions for the development of agricultural pests and molds.

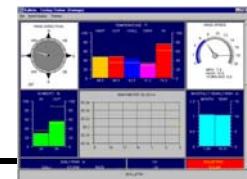
Yearly Rainfall . . . . . Calculates rainfall totals broken down by month and year. Rainfall data may be altered and data may be added to reflect rainfall totals for months and years which are not contained in your weather database.

## **Package Dimensions**

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<b>Product #</b>	<b>Package Dimensions (Width x Height x Depth)</b>	<b>Package Weight</b>	<b>UPC Codes</b>
6520	6.00" x 9.00" x 1.63" (152 mm x 229 mm x 42 mm)	8.0 oz. (0.23 kg)	011698 00735 6





## Software and Data Logger

WeatherLink for Macintosh OS X, consists of our WeatherLink software and a data logger. The data logger connects to a Weather Monitor II, Weather Wizard III, or Perception weather station to enable the transfer of data from your weather station console to your computer. Once the data is stored in the database, your weather information may be used to generate a wide variety of reports and graphical displays.

## General Description

The software enables transfer of data from the WeatherLink to your computer for creation of a permanent weather database. Once stored in the database, the information may be used in the generation of a wide variety of numerical reports and graphical displays.

## WeatherLink Software Features

- Displays the current weather station data in a real-time "bulletin" on the computer.
- Allows you to set and clear data in the weather station console (time and date, highs and lows, alarm thresholds, calibration numbers, etc.) from the computer.
- Graphs archived weather data on an hourly, daily, weekly, monthly, or yearly basis.
- Generates Weather Watcher reports in the National Climatic Data Center (NOAA) format.
- Collects data from multiple weather stations on the same computer.
- Posts weather conditions to your web site.

## WeatherLink Data Logger Features

- Archives weather data for subsequent transfer to the computer.
- Manages data communication between the weather station and the WeatherLink software.

## System Requirements

Apple Macintosh computer running OS X with 5 MB of free disk space plus a USB/serial port adapter. The amount of disk space necessary for the database files depends on the archive interval. Database files containing data stored at a 30-minute archive interval require approximately 120K of disk space per month of data. The file size changes in a linear fashion depending on the archive interval. For example, data stored at a 1-minute interval requires approximately 3.6 MB/month, while the data stored at a 2-hour interval requires approximately 30K/month. For phone modem connections, the following additional hardware is required: One external modem to connect to the WeatherLink and one internal modem or external modem connected to your computer (modems must be Hayes compatible and run at either 1200 or 2400 baud), and Telephone Modem Adapter (#7870).

## WeatherLink Product Information

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### Current Data

Current data are contained in an 18-byte "sensor image" which is available to be transmitted to the computer for real-time "bulletin" display.

Sensor Image Data . . . . . Inside Temperature, Outside Temperature, Wind Direction (0°-360°),  
Wind Speed, Rainfall Total, Inside Humidity, Outside Humidity,  
Barometer

Transmission Interval . . . . . Once per second (approximately)

### Data Logging

Weather data are stored in 21-byte archival records. The records are contained in the 32K "archive" (1560 records) which may be transferred to the computer using the software. Maxima, minima, and averages are taken over the archive interval.

**WeatherLink**

Archive Record Data .....	Inside Temperature (avg.), Outside Temperature (avg.), Maximum Air Temperature, Minimum Air Temperature, Wind Direction (dominant), Wind Speed (avg.), Maximum Wind Speed, Rainfall (increment), Inside Humidity (last), Outside Humidity (last), Barometric Pressure (last), Time/Date of Record
Archive Interval .....	User-selectable from the following intervals (in minutes): 1, 5, 10, 15, 30, 60, or 120
Storage Capacity (the amount of time before the archive is completely filled)	
1 Minute Archive Interval .....	1 day
5 Minute Archive Interval .....	5 days
10 Minute Archive Interval .....	10 days
15 Minute Archive Interval .....	15 days
30 Minute Archive Interval .....	30 days
60 Minute Archive Interval .....	60 days
120 Minute Archive Interval .....	120 days

**Communication Protocol**

Data Channel Characteristics .....	1200 or 2400 baud (switch-selectable), RS-232, half-duplex, data only (no CTS or RTS)
Isolation .....	Ground isolation is provided by photo-couplers in the Link Isolator (available separately).

**WeatherLink for Macintosh Software Information****Data Display Options**

Real-Time Displays (these displays update in real-time)

Graphical Bulletin .....	Displays current conditions, highs and lows, and barometric trend.
Summary Window (text) .....	Displays current conditions and highs and lows along with the time at which they occurred.

Plotting Displays

Plot Window .....	Enables graphing of all database information (multiple variables may be plotted on a single graph) over any of the following spans (1 hr, 4 hr, 8 hr, 12 hr, 1 day, 3 days, Week, Month, Year).
Strip Charts .....	Three stacked line graphs (multiple variables may be plotted on a single graph), which can be updated at the time of each archive interval. Strip charts may use any of the following spans (1 hr, 4 hr, 8 hr, 12 hr, 1 day, 3 days, Week, Month, Year).

Reports

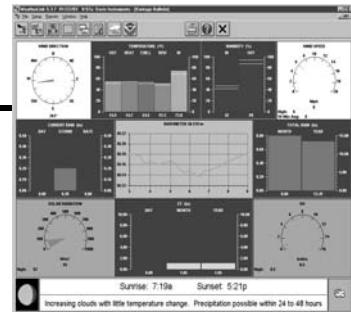
Chilling Requirements .....	Calculates the number of hours spent below a specified temperature during a specified period of time. Typically used to determine if the coldness requirement for a fruit tree in dormancy has been met.
Degree-Days .....	Tracks degree-days and progress towards development for an unlimited number of crops or pests; base and upper development thresholds and development totals entered by user.
NOAA Monthly Summary .....	Based on the National Oceanic and Atmospheric Administration (NOAA) Monthly Weather Watcher report.
NOAA Yearly Summary .....	Based on the National Oceanic and Atmospheric Administration (NOAA) Yearly Weather Watcher report.
Soil Temperature Hours .....	Calculates the time that soil temperature has been above freezing (or some other threshold). Typically used to determine a time to plant crops.
Sunrise & Sunset Times .....	Calculates sunrise and sunset times for any given latitude, longitude and date.
Temperature/Humidity Hours .....	Calculates the number of hours the temperature has been either above or below a given threshold, and that during which time the humidity was above a given threshold from a given start date. Typically used to track conditions for the development of agricultural pests and molds.
Yearly Rainfall .....	Calculates rainfall totals broken down by month and year. Rainfall data may be altered and data may be added to reflect rainfall totals for months and years which are not contained in your weather database.

## Package Dimensions

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Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7855	9.30" x 7.00" x 1.75" (235 mm x 178 mm x 45 mm)	9.3 oz. (0.27 kg)	011698 00382 2





WeatherLink

## Data Logger and Software

The WeatherLink data logger (referred to as the WeatherLink) contains a microprocessor, ROM, and 32K RAM. When used with the WeatherLink software, it does the following:

- Makes current sensor output data available for real-time "bulletin" display on the computer.
- Logs weather data for subsequent transfer to the computer.
- Enables user to set and clear data in the weather station console (time and date, highs and lows, alarm thresholds, calibration numbers, etc.) from the computer.
- Manages data communication with the computer.

Details of data formatting and content are contained in the Programmer's Reference Library (#7864, available upon request); the contents of the Library may be downloaded from the Davis website (<http://www.davisnet.com/support/download>).

The WeatherLink software provides a wide range of numeric and graphical display features.

## General Description

The WeatherLink software enables transfer of data from the WeatherLink to your computer for creation of a permanent weather database. Once stored in the database, the information may be used in the generation of a wide variety of numerical reports and graphical displays.

## System Requirements

Computer running Windows™ 95, 98, ME, NT 4.0, Windows 2000 or XP with at least one free serial port and 5 MB of free disk space, or Computer running Windows™ 98 SE, ME, Windows 2000 or XP with at least one free USB port and 5 MB free disk space. The amount of disk space necessary for the data files depends on the archive interval. Database files containing data stored at a 30-minute archive interval require approximately 36K of disk space per month of data. The file size changes in a linear fashion depending on the archive interval. For example, data stored at a 1-minute interval requires approximately 1 MB/month, while the data stored at a 2-hour interval requires approximately 9K/month. For phone modem connections, the following additional hardware is required: One external modem to connect to the WeatherLink and one internal modem or external modem connected to your computer (modems must be Hayes compatible and run at either 1200 or 2400 baud), and Telephone Modem Adapter (#7870).

## Current Data

Current data are contained in an 18-byte "sensor image" which is available to be transmitted to the computer for real-time "bulletin" display.

Sensor Image Data . . . . .	Inside Temperature, Outside Temperature, Wind Direction (0°-360°), Wind Speed, Rainfall Total, Inside Humidity, Outside Humidity, Barometer
Transmission Interval . . . . .	Once per second (approximately)

## Data Logging

Weather data are stored in 21-byte archive records. The records are contained in the 32K "archive" (1560 records) which may be transferred to the computer using the software. Maxima, minima, and averages are taken over the archive interval.

Archive Record Data . . . . .	Inside Temperature (avg.), Outside Temperature (avg.), Maximum Air Temperature, Minimum Air Temperature, Wind Direction (dominant), Wind Speed (avg.), Maximum Wind Speed, Rainfall (increment), Inside Humidity (last), Outside Humidity (last), Barometric Pressure (last),
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**WeatherLink**

## Time/Date of Record

Archive Interval ..... User-selectable from the following intervals (in minutes): 1, 5, 10, 15, 30, 60, or 120

Storage Capacity (the amount of time before the archive is completely filled)

1 Minute Archive Interval .....	1 day
5 Minute Archive Interval .....	5 days
10 Minute Archive Interval .....	10 days
15 Minute Archive Interval .....	15 days
30 Minute Archive Interval .....	30 days
60 Minute Archive Interval .....	60 days
120 Minute Archive Interval .....	120 days

**Communication Protocol** (See Programmer's Reference Disk)

Data Channel Characteristics ..... 1200 or 2400 baud (switch-selectable), RS-232, half-duplex, data only (no CTS or RTS)

Isolation ..... Ground isolation is provided by photo-couplers in the Link Isolator Kit (available separately).

**WeatherLink for Windows Software Information****Data Display Options**

Real-Time Displays (these displays update in real-time)

Graphical Bulletin .....	Displays current conditions, highs and lows, and barometric trend.
Text-Based Summary .....	Displays current conditions and highs and lows along with the time at which they occurred.

## Plotting Displays

Plot Window ..... Enables graphing of all database information (multiple variables may be plotted on a single graph) over any of the following spans (1 hr, 4 hr, 8 hr, 12 hr, 1 day, 3 days, Week, Month, Year). Multiple dates may also be plotted on the same graph.

Strip Charts ..... Four stacked line graphs (multiple variables may be plotted on a single graph), which update at the time of each archive interval. Strip charts may use any of the following spans (1 hr, 4 hr, 8 hr, 12 hr, 1 day, 3 days, Week, Month, Year).

Yearly Rainfall ..... Accumulates rainfall totals broken down by month and year. Rainfall data may be altered and data may be added to reflect rainfall totals for months and years which are not contained in your weather database.

Degree-Days ..... Tracks degree-days and progress towards development for an unlimited number of crops/pests; base and upper development thresholds and development totals entered by user.

Reports (generated using sensor data) ..... Temperature/Humidity Hours, Soil Temperature Hours, Chilling Requirements, Sunrise & Sunset Times, NOAA Monthly Summary, NOAA Yearly Summary

**Control**

The user may exercise a number of control functions via the WeatherLink:

Control Functions Available ..... Set Archive Interval, Set Calibration Numbers, Set Alarm Thresholds and Time, Clear Total Values, Set Time and Date

Automatic Download ..... Data may be transferred from the WeatherLink to the computer once per hour. Software may be configured to fax last 2 days worth of data immediately following automatic download.

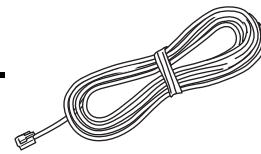
Automatic Clear ..... Selected highs, lows, and rainfall totals may be automatically cleared at the same time each day.

## Package Dimensions

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Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7862	9.00" x 7.00" x 1.50" (232 mm x 178 mm x 38 mm)	15.0 oz. (0.43 kg)	011698 78620 6





Use the 4-Conductor Extension Cable with versions of these products:

- **Cabled Vantage Pro2 Console**
- **Anemometer**
- **Rain Collector**
- **Solar Radiation Sensor**
- **UV Sensor**
- **Temperature Sensor or Probe**
- **WeatherLink®**

The 4-Conductor Extension Cable includes waterproof coupler kits for joining two cables together. The following 4-Conductor Extension Cables are available:

- **#7876-008, 8' (2.4m)**
- **#7876-040, 40' (12m)**
- **#7876-100, 100' (30m)**
- **#7876-200, 200' (61m)**

Use the chart below to determine your maximum cable length. Cable length may affect the accuracy of data transmitted from the sensor or data logger to the console. We recommend you stay within the maximum ranges as described below.

Station	From	To	Maximum Cable Length
Vantage Pro2®	ISS	Anemometer	Maximum wind speed reading decreases as the length of the cable increases. At 140' (43 m) maximum speed is 175 mph (78 m/s). At 340' (104 m), maximum speed is 70 mph (31 m/s). The accuracy of the reading below the maximum is not affected.
	ISS	Solar Radiation Sensor	Maximum is 125' (38 m)
	ISS	UV Sensor	Maximum is 125' (38 m)
	Console	ISS	Maximum is 1000' (300 m)
	WeatherLink	Computer	Maximum is 48' (14.6 m)
Weather Wizard III® or Weather Monitor II®	Console	Anemometer	Maximum wind speed reading decreases as the length of the cable increases. At 140' (43 m) maximum speed is 175 mph (78 m/s). At 340' (104 m), maximum speed is 70 mph (31 m/s). The accuracy of the reading below the maximum is not affected.
	Console	Rain Collector	Maximum is 900' (274 m)
	Console	Temperature Sensor or Probe	Maximum is 900' (274 m)
	WeatherLink	Computer	Maximum is 50' (15 m)

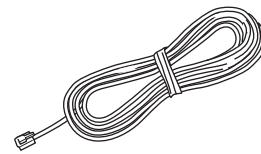
## Package Dimensions

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Product #	Package Dimensions (Height x Width x Depth)	Package Weight	UPC Codes
7876-008	6.63" x 6.00" x 1.00" (153 mm x 168 mm x 26 mm)	2.9 oz. (0.09 kg)	011698 00310 5
7876-040	3.50" x 7.00" x 1.50" (89 mm x 178 mm x 26 mm)	7.5 oz. (0.22 kg)	011698 78761 6
7876-100	9.00" x 5.50" x 1.50" (229 mm x 140 mm x 39 mm)	1.1 lbs. (0.51 kg)	011698 78762 3
7876-200	11.00" x 7.00" x 1.50" (280 mm x 178 mm x 38 mm)	2.2 lbs. (.99 kg)	011698 00311 2

# 6-Conductor Extension Cable

7878



Cables

Use the Standard 6-Conductor Cable with standard versions of these products:

- Temperature/Humidity Sensor
- Leaf Wetness Sensor
- UV Sensor

The Standard 6-Conductor Cable includes waterproof coupler kits for joining two cables together.

## Specifications

The following 6-Conductor Extension Cable is available:

- #7878-040, 40' (12m)

Use the chart below to determine your maximum cable length. Cable length affects the accuracy of data transmitted from the sensor to the console or Sensor Interface Module. We recommend you stay within the maximum ranges as described below.

Station	From	To	Maximum Cable Length
Weather Monitor II®	Temperature/ Humidity Sensor	Console	Maximum is 300' (91 m) to console, including cable from the Junction Box or Sensor Interface Module to the console

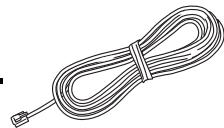
## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7878-040	7.00" x 4.00" x 2.50" (178 mm x 101 mm x 69 mm)	11 oz. (0.32 kg)	011698 78781 4



# 8-Conductor Extension Cable

7880



Cables

For use from the Weather Wizard III<sup>®</sup> or the Weather Monitor II<sup>®</sup> console to:

- **Junction Box**
- **Protected Junction Box**
- **Remote Display Unit**

To join two 8-conductor cables together, add an 8-pin coupler (for indoor use only).

The following 8-Conductor Extension Cables are available:

- **#7880-025, 25' (7.5 m)**
- **#7880-050, 50' (15 m)**
- **#7880-100, 100' (30 m)**

Use the chart below to determine your maximum cable length. Cable length affects the accuracy of data transmitted from the Junction Box, Shelter, Display Unit, or Sensor Interface Module to the console. The maximum recommended cable length for each product is shown in the table below.

Station	From	To	Maximum Cable Length
Weather Wizard III or Weather Monitor II	Console	Junction Box	Maximum is 125' (38 m)
	Console	Protected Junction Box or EZ-Mount Shelter	Maximum is 200' (60 m)
	Console	Remote Display Unit	Maximum is 300' (91 m)

## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
7880-025	3.50" x 3.50" x 2.25" (89 mm x 89 mm x 58 mm)	9.5 oz. (0.27 kg)	011698 78800 2
7880-050	5.00" x 5.00" x 2.00" (127 mm x 127 mm x 51 mm)	1.0 lbs. (0.49 kg)	011698 78801 9
7880-100	6.00" x 6.00" x 3.00" (153 mm x 153 mm x 77 mm)	2.3 lbs. (1.06 kg)	011698 78802 6



# Windscribe

## Ultrasonic Wind & Temperature Meter

0276



Windscribe

WindScribe™ uses patented ultrasound technology to measure wind speed, temperature and wind chill. Both compact and lightweight, WindScribe contains no moving parts and has nothing to wear out or break. It's easy to use: just point into the wind. WindScribe measures wind speed in two directions. Headwinds are indicated as a positive wind speed and tailwinds are indicated as a negative wind speed. The easy to read, large LCD display includes a hold feature to capture readings. WindScribe is always ready to go, with nothing to collapse or fold in order to use it.

### Physical

Wind Speed Sensor	Ultrasonic
Temperature Sensor	Ultrasonic
Batteries	CR2032, 3 volt lithium cell
Battery Life	600 hours
Operating Temperature	-4° to +122°F (-20° to +50°C)
Storage Temperature	+32° to +122°F (0° to +50°C)
Case Material	ABS plastic
Dimensions	5.0" x 3.0" x 0.9" (127 x 76 x 23mm)
Weight	4 oz. (120 g)

### Operation

Buttons	ON/HOLD button (on, display hold, off and clear) WIND button (select wind speed display mode and units) TEMP button (select temperature display mode and units)
Auto Shutdown	After 5 minutes of no button use and zero wind speed.

### Display

Update Interval	1.25 seconds
Type	LCD

### Wind Speed

Display Modes	current (1.25 second avg.), 5 second avg., running avg., maximum, minimum
Measurement Units	MPH, knots, fps, fpm(10), km/h, and m/s
Resolution	0.1 for all units
Speed Range	+/- 150 mph
Minimum Measured Speed	0.3 mph
Accuracy	± 3%
Sample Period	80ms
Update Interval	1.25 seconds (average of last 16 samples)
Running Average Capture	Every 5 seconds
Calibration Method	No calibration required, zero speed set at startup
Calibration Drift	None

## Temperature

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Display Modes . . . . .	current (1.25 second avg.), maximum, minimum, wind chill, minimum wind chill
Resolution and Units . . . . .	0.1°F or 0.1°C (user-selectable)
Range . . . . .	-40° to +150°F (-40° to +65°C)
Accuracy . . . . .	± 2°F (1°C) >32°F (0°C), ± 4°F (2°C) <32°F (0°C)
Sample Period . . . . .	80 ms
Update Interval . . . . .	1.25 seconds (average of last 16 samples)
Calibration Method . . . . .	Current temperature range set at startup
Calibration Drift . . . . .	None

## Wind Chill

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Wind Chill Range . . . . .	-40° to +80°F (-40° to +270°C)
Min Wind Chill Capture . . . . .	Every 5 seconds
Wind Chill Formula . . . . .	Osczevski (1995) (adopted by US NWS in 2001)
Wind Chill Source Variables . . . . .	Current temperature and 5 second average wind speed

## Package Dimensions

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Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
0276	10.00" x 6.00" x 1.70" (250 mm x 152 mm x 45 mm)	7.1 oz. (0.2 kg)	011698 00598 7